

PATENT ABSTRACTS OF JAPAN

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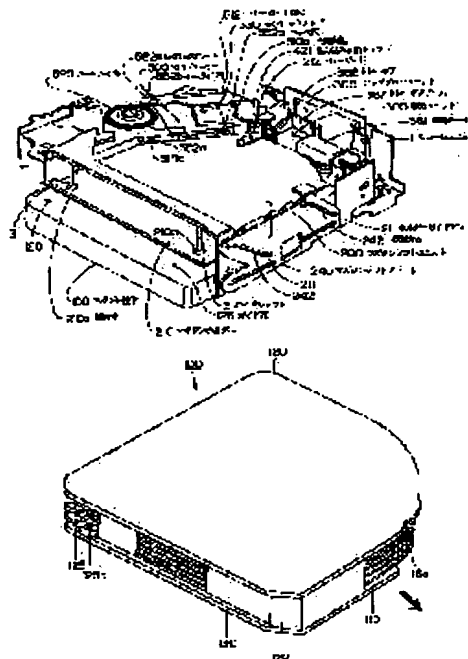
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(54) DISK DEVICE AND DISK MAGAZINE

(57)Abstract:

PROBLEM TO BE SOLVED: To obtain a disk device capable of realizing the satisfied operation by preventing the deviation at the time of dividing a disk magazine into the upper/lower parts and combining them with simple constitution.

SOLUTION: A magazine casing 100 is constituted of the upper surface part 120 of the magazine and the lower surface part 130 of the magazine. A magazine shift unit 200 moving upward/downward on the upper surface part 120 of the magazine, an up/down unit 300 for selecting the desired disk, a swing unit 400 swung into the part between the divided upper and lower magazine casings 100, and a drive unit 500 provided on the swing unit 400 for reproducing the selected disk, are provided on a chassis unit 1. Guide holes 126 in the vertical direction are formed on the upper surface part 120 of the magazine. Guide shafts 3 in the vertical direction for being inserted through the guide holes 126 at the time of moving upward/downward on the upper surface part of the magazine are provided on the chassis unit 1.



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CLAIMS

[Claim(s)]

[Claim 1] The tray equipped with a disk of two or more sheets is contained. The disk magazine which can be divided into the top-face section and the inferior-surface-of-tongue section, The chassis unit equipped with said disk magazine, and the magazine division section which makes said disk magazine with which said chassis unit was equipped divide and coalesce, The disk selection section which chooses a desired disk, and the swing unit transferred between the divided up-and-down disk magazines, In the disk unit which has the disk playback section which plays the disk which was prepared on said swing unit and chosen by said disk selection section A vertical guide hole is formed in either [at least] the top-face section of said disk magazine, or the inferior-surface-of-tongue section. To said chassis unit The disk unit characterized by preparing the guide shaft of the perpendicularly it inserts in said guide hole at the time of division of said disk magazine and coalesce.

[Claim 2] The tray equipped with a disk of two or more sheets is contained. The disk magazine which can be divided into the top-face section and the inferior-surface-of-tongue section, The chassis unit equipped with said disk magazine, and the magazine division section which makes said disk magazine with which said chassis unit was equipped divide and coalesce, The disk selection section which chooses a desired disk, and the swing unit transferred between the divided up-and-down disk magazines, In the disk unit which has the disk playback section which plays the disk which was prepared on said swing unit and chosen by said disk selection section said magazine division section The magazine electrode holder which grasped the top-face section or the inferior-surface-of-tongue section of said disk magazine, and was prepared in said chassis unit possible [rise and fall], It has the cylindrical cam prepared in said chassis unit rotatable, and the driving source which rotates said cylindrical cam. The disk unit characterized by preparing an electrode-holder guide pin in the end of said magazine electrode holder, forming a spiral cam in the lateral surface of said cylindrical cam, and inserting said electrode-holder guide pin in said spiral cam.

[Claim 3] said magazine division section -- said chassis unit -- order -- a slide -- with the magazine shift plate prepared movable It has the transfer device in which the driving force of said driving source is transmitted to said magazine shift plate. Said cylindrical cam and said magazine shift plate Insert said magazine electrode holder in between, and it is arranged in the opposite side the transfer side of said disk playback section. To said said cylindrical-cam [in said magazine electrode holder], and magazine shift plate side An electrode-holder guide pin is prepared, respectively and an inclination cam die is prepared in said magazine shift plate. One electrode-holder guide pin of said magazine electrode holder It is the disk unit according to claim 2 characterized by being inserted in the spiral cam of said cylindrical cam, and inserting the electrode-holder guide pin of another side in the inclination cam die of said magazine shift plate.

[Claim 4] The tray equipped with a disk of two or more sheets is contained. The disk magazine which can be divided into the top-face section and the inferior-surface-of-tongue section, The chassis unit equipped with said disk magazine, and the magazine division section which makes said disk magazine with which said chassis unit was equipped divide and coalesce, The disk selection section which

chooses a desired disk, and the swing unit transferred between the divided up-and-down disk magazines, In the disk unit which has the disk playback section which plays the disk which was prepared on said swing unit and chosen by said disk selection section said disk playback section On said swing unit, it is supported through two or more dampers. At least one of said two or more dampers The disk unit characterized by being the movable absorber which was able to prepare between the stowed position in the movable range of said disk playback section, and the evacuation locations from which it separates from the movable range of said disk playback section movable.

[Claim 5] Before transfer of said swing unit, it considers as the floating lock condition which regulates the variation rate of said disk playback section. After transfer of said swing unit The floating lock device which makes said disk playback section floating by support of only said absorber is established. When said disk playback section is in a floating lock condition When said movable absorber is in a stowed position and said disk playback section is in a floating lock condition The disk unit according to claim 4 characterized by establishing the gear device in which said floating lock device and said movable absorber are synchronized so that said movable absorber may come to an evacuation location.

[Claim 6] The tray equipped with a disk of two or more sheets is contained. The disk magazine which can be divided into the top-face section and the inferior-surface-of-tongue section, The chassis unit equipped with said disk magazine, and the magazine division section which makes said disk magazine with which said chassis unit was equipped divide and coalesce, The disk selection section which chooses a desired disk, and the swing unit transferred between the divided up-and-down disk magazines, In the disk unit which has the disk playback section which plays the disk which was prepared on said swing unit and chosen by said disk selection section to said chassis unit The disk unit characterized by preparing the attaching part holding the tip of said transferred swing unit.

[Claim 7] The disk unit according to claim 6 characterized by preparing the hold arm which holds the edge of the opposite side with said swing unit tip held at said attaching part when said swing unit is transferred.

[Claim 8] The disk unit according to claim 7 characterized by preparing the hold plate which presses said hold arm in the swing unit maintenance direction when said swing unit is transferred.

[Claim 9] The disk magazine characterized by preparing the tray of two or more sheets multistory in the case which consists of a top-face plate, an inferior-surface-of-tongue plate, and a side-face plate, and forming the notch at least in one side by the side of said top-face plate and said inferior surface of tongue from the opening side face in said case in the disk magazine which can hold a disk between said trays at the opening side-face side.

[Claim 10] in the opening side face and the opposite side in said case, a disk discharge lever is prepared rotatable and it becomes possible for the end of said disk discharge lever to press it a disk -- as -- the edge of a disk -- contacting -- the other end of said disk discharge lever -- the rotation from the outside -- the disk magazine according to claim 9 characterized by having exposed so that it may become operational.

[Translation done.]

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] By choosing a desired disk, starting playback and the disk unit to record out of the disk magazine which held two or more disks, and performing disk selection, playback, and record, where a disk magazine is divided especially up and down, this invention enables contiguity arrangement of each configuration member, and relates to the disk magazine used for the disk unit and this aiming at the miniaturization of the whole equipment.

[0002]

[Description of the Prior Art] In recent years, the spread of the disk units using a disk as a medium is remarkable like a CD player or MD player. Especially, as a disk unit for mount, the thing of the autochanger type which chooses a desired disk and is reproduced out of the disk magazine which contained two or more disks is developed. Since the disk unit of this autochanger type does not need to take one disk at a time in and out whenever it exchanges the disk to play, it is convenient especially as an object for mount.

[0003] The disk unit using such a disk magazine adjoins the magazine hold section, and the disk playback section is arranged. And after pulling out the disk of the request in a magazine and conveying and setting to the disk playback section according to a conveyance device, there was much what performs disk playback. However, if it is made this configuration, in order to secure the tooth space which sets a disk to the disk playback section and is reproduced, it is necessary to keep a fixed distance between the disk playback sections and the magazine hold sections which were prepared adjacently. Therefore, as a device for mount by which the whole disk unit will large-sized-size, and the installation tooth space was restrained, it was disadvantageous.

[0004] For example, if it sees for the latest audio equipment for mount, the opening dimension by the side of the car which contains it will have been unified into 180x50 (mm) called DIN size or 180x100 (mm) called double DIN size. Moreover, that which gets mixed up 160mm and suits also about the depth dimension of opening is the present condition, and receives constraint of the audio equipment anchoring tooth space of a car.

[0005] On the other hand, since considering that the size of a compact disk is the diameter of 120mm the dimension more than 2= 120x240 (mm) is needed in the longest direction of breadth by the above disk units, it turns out that a device cannot be contained at opening located beside a driver's seat.

[0006] He is trying to contain the inside of the trunk of a car, and near the step of a driver's seat in the conventional CD autochanger from the above situations. However, in the case of the former, there is a fault, like the long line which will not become if open a trunk whenever it is the exchange of a disk to which a trunk tooth space becomes narrow, and it kicks and which connects a trunk and a control unit is needed. Moreover, in the case of the latter, a space part underfoot becomes so narrow, and when a guide peg touches accidentally, it may damage.

[0007] In order to cope with this, a disk magazine is divided up and down and the disk unit which performs disk playback where the disk playback section is transferred between them is proposed as

proposed by JP,6-203519,A. Since a disk stowed position and a disk playback location lap, such a disk unit can reduce a horizontal tooth space.

[0008] In addition, usually performs division of a disk magazine with the magazine electrode holder prepared in the chassis unit possible [rise and fall]. That is, the configuration of raising a magazine electrode holder with the pin which moves in the inside of a stair-like cam is taken by inserting the pin fixed to the magazine electrode holder in the stair-like cam formed in the cam plate, and carrying out slide migration of this cam plate in order. And by holding a upside disk magazine and raising this magazine electrode holder with a magazine electrode holder, a upside disk magazine is lifted with an internal tray, and it divides from a lower disk magazine.

[0009]

[Problem(s) to be Solved by the Invention] However, there were the following points which should be improved in the disk unit using the disk magazine of the above block construction. That is, if a gap arises in the location of an up-and-down disk magazine in case the divided disk magazine is made to coalesce again, a malfunction will be produced, without the ability coalescing. If a firm maintenance device tends to be used or it is going to raise location precision in order to cope with this, a complicated mechanism and expensive components will be needed and it will become disadvantageous for a miniaturization and low-cost-izing.

[0010] Moreover, in order to go up and down the magazine electrode holder by the cam plate smoothly as mentioned above, it is necessary to prepare a cam plate in right and left of a magazine electrode holder, or two locations which are called order and which counter. However, to make it the configuration which transfers the disk playback section between the divided disk magazines, it is necessary to make the disk playback section for transfer stand by for one of right and left. For this reason, in small equipment which goes into DIN size, the cam plate arranged in the standby side of the disk playback section cannot secure the stroke of a cross direction easily. Moreover, since it is necessary to release the front of a magazine electrode holder, i.e., a near side, as magazine insertion opening, it is not realistic. [of preparing a cam plate before and after a magazine electrode holder]

[0011] Moreover, in the disk unit for mount, in order to reduce the vibration from the outside, the vibrationproofing device which used the damper etc. for the disk playback section is established. However, the optical pickup which moves in the direction of a path of a disk is surely prepared in the disk playback section. For this reason, if a damper is not formed outside that successive range as it does not serve as hindrance of migration of optical pickup, there is. [no] Therefore, the area for absorbers is needed for an excess at the disk playback section, and it leads to enlargement of the whole disk unit.

[0012] Moreover, the disk playback section is usually prepared on the swing unit which rotates centering on a revolving shaft. For this reason, when transferred between the up-and-down disk magazines with which the swing unit was divided, the disk playback section will be supported only by one point of the rotation supporting point of a swing unit, and becomes weak to vibration. Therefore, it becomes disadvantageous when using as a disk unit for mount.

[0013] Moreover, since a fingerprint will attach a disk signal side and it will cause poor playback if it is touched by the direct hand, in case a disk is taken in and out of a disk magazine, it fully needs to be careful. And the disk magazine has the structure of taking a disk in and out between the trays which are the shelves with which the interior is divided multistory. Therefore, when putting a disk into a disk magazine, it can put in by having the periphery of a disk, and pushing and putting in the back end after inserting in a disk magazine, without touching a signal side. However, since the disk needed to be gathered and removed in the place to which the disk was extruded and the disk came out of the disk magazine a little when removing a disk from a disk magazine, the fingerprint may have been left on the signal side.

[0014] In order to cope with this, making the appearance of a disk magazine small and considering as the configuration in which a disk is exposed to some extent beforehand is also considered. If it is made this configuration, the amount of protrusions of the disk in the case of ejection can be enlarged, and it can take out easily by holding the edge of a disk, without touching a signal side. However, the exposed part of a disk may be damaged in the time of inserting and discharging a disk magazine to a disk unit in

this case, and the case of carrying.

[0015] This invention is to be proposed in order to solve the trouble of the above conventional techniques, and for the purpose to prevent the gap at the time of dividing a disk magazine up and down and coalescing according to a simple device, and offer the disk unit which can realize good actuation. Moreover, the 2nd purpose of this invention is to offer the small disk unit which can prepare the transfer structure of the disk playback section, and the rise-and-fall structure of a magazine electrode holder in a narrow tooth space. Moreover, the 3rd purpose of this invention is to offer the small disk unit which can save the area for absorbers, without spoiling an oscillating reduction function. Moreover, the 4th purpose of this invention can hold more firmly the swing unit in which the disk playback section was prepared, and is to offer a disk unit strong against the vibration at the time of disk playback. Moreover, the 5th purpose of this invention is to offer the disk magazine which can prevent damage on the disk at the time of detaching and attaching to a disk unit while preventing the dirt of the signal side in the case of receipts and payments of a disk.

[0016]

[Means for Solving the Problem] In order to solve the above troubles, the disk unit of this invention The tray equipped with a disk of two or more sheets is contained. The disk magazine which can be divided into the top-face section and the inferior-surface-of-tongue section, The chassis unit equipped with said disk magazine, and the magazine division section which makes said disk magazine with which said chassis unit was equipped divide and coalesce, The disk selection section which chooses a desired disk, and the swing unit transferred between the divided up-and-down disk magazines, It is prepared on said swing unit and has the following technical features in the disk unit which has the disk playback section which plays the disk chosen by said disk selection section.

[0017] That is, a vertical guide hole is formed in either [at least] the top-face section of said disk magazine, or the inferior-surface-of-tongue section, and invention according to claim 1 is characterized by preparing the guide shaft of the perpendicularly it inserts in said guide hole at the time of division of said disk magazine and coalesce in said chassis unit. In the above invention according to claim 1, in case the magazine division section divides a disk magazine, the top-face section or the inferior-surface-of-tongue section of a disk magazine moves perpendicularly. A guide shaft inserts in the guide hole formed in the top-face section or the inferior-surface-of-tongue section which moves at this time. And in case a disk magazine is coalesced, since migration of the magazine top-face section or the inferior-surface-of-tongue section is guided by the guide shaft inserted in the guide hole, a location gap is prevented and a malfunction does not arise by it.

[0018] Invention according to claim 2 said magazine division section The magazine electrode holder which grasped the top-face section or the inferior-surface-of-tongue section of said disk magazine, and was prepared in said chassis unit possible [rise and fall], It has the cylindrical cam prepared in said chassis unit rotatable, and the driving source which rotates said cylindrical cam. An electrode-holder guide pin is prepared in the end of said magazine electrode holder, a spiral cam is formed in the lateral surface of said cylindrical cam, and it is characterized by inserting said electrode-holder guide pin in said spiral cam. In the above invention according to claim 2, by the cylindrical cam to which the depth (before or after) direction and the width-of-face (right and left) direction do not take a comparison-tooth space, since a magazine electrode holder is moved up and down, space-efficient member arrangement is attained and the miniaturization of the whole equipment becomes easy.

[0019] Invention according to claim 3 is set to a disk unit according to claim 2. Said magazine division section said chassis unit -- order -- a slide -- with the magazine shift plate prepared movable It has the transfer device in which the driving force of said driving source is transmitted to said magazine shift plate. Said cylindrical cam and said magazine shift plate Insert said magazine electrode holder in between, and it is arranged in the opposite side the transfer side of said disk playback section. To said said cylindrical-cam [in said magazine electrode holder], and magazine shift plate side An electrode-holder guide pin is prepared, respectively and an inclination cam die is prepared in said magazine shift plate. One electrode-holder guide pin of said magazine electrode holder It is characterized by being inserted in the spiral cam of said cylindrical cam, and inserting the electrode-holder guide pin of another

side in the inclination cam die of said magazine shift plate. Although a depth tooth space becomes short in the above invention according to claim 3 in the transfer side of the disk playback section in a magazine electrode holder, since the depth stroke with a long cylindrical cam is unnecessary, trouble does not have it in rise and fall of a magazine electrode holder. Moreover, since the transfer side of the disk playback section and the opposite side tend to secure a depth tooth space, although they need a depth stroke, they can shorten the cross direction of equipment by using the magazine shift plate which does not need to take width of face. Therefore, transfer structure of the disk playback section and rise-and-fall structure of a magazine electrode holder can be realized to a narrow tooth space, and the whole disk unit can be miniaturized to it.

[0020] Said disk playback section is supported for invention according to claim 4 through two or more absorbers on said swing unit, and at least one of said two or more absorbers is characterized by being the movable absorber which was able to prepare between the stowed position in the movable range of said disk playback section, and the evacuation locations from which it separates from the movable range of said disk playback section movable. In the above invention according to claim 4, after swing unit transfer can save necessary area by containing a movable absorber to a stowed position at the time of swing unit standby, without spoiling the oscillating reduction function by the absorber by removing a movable absorber from the movable range of the disk playback section, and performing disk playback.

[0021] Invention according to claim 5 is set to a disk unit according to claim 4. Before transfer of said swing unit It considers as the floating lock condition which regulates the variation rate of said disk playback section. After transfer of said swing unit The floating lock device which makes said disk playback section floating by support of only said absorber is established. When said disk playback section is in a floating lock condition When said movable absorber is in a stowed position and said disk playback section is in a floating lock condition, it is characterized by establishing the gear device in which said floating lock device and said movable absorber are synchronized so that said movable absorber may come to an evacuation location. In the above invention according to claim 5, since migration of a movable absorber can be synchronized with a floating lock device, it can limit, when absorber support is required, and a movable absorber can be moved to an evacuation location.

[0022] Invention according to claim 6 is characterized by preparing the attaching part holding the tip of said transferred swing unit in said chassis unit. In the above invention according to claim 6, at the time of the disk playback by the disk playback section, since the tip of a swing unit is held by the attaching part, it becomes the rotation supporting point and two-point support with an attaching part, and becomes strong to vibration.

[0023] In a disk unit according to claim 6, invention according to claim 7 is characterized by preparing the hold arm holding the edge of the opposite side with said swing unit tip held at said attaching part, when said swing unit is transferred. In the above invention according to claim 7, since the opposite end is held by the hold arm at the time of the disk playback by the disk playback section while the tip of a swing unit is held by the attaching part, it becomes three-point support of the rotation supporting point, an attaching part, and a hold arm, and becomes stronger to vibration.

[0024] In a disk unit according to claim 7, invention according to claim 8 is characterized by preparing the hold plate which presses said hold arm in the swing unit maintenance direction, when said swing unit is transferred. In the above invention according to claim 8, since a hold plate presses a hold arm at the time of the disk playback by the disk playback section while three swing units are supported by the rotation supporting point, an attaching part, and the hold arm, it is held still more firmly.

[0025] Moreover, the tray of two or more sheets is prepared multistory in the case which consists of a top-face plate, an inferior-surface-of-tongue plate, and a side-face plate, and the disk magazine of this invention has the following technical features from the opening side face in said case in the disk magazine which can hold a disk between said trays.

[0026] That is, invention according to claim 9 is characterized by forming the notch in the opening side-face side at least at one side by the side of said top-face plate and said inferior surface of tongue. Since the disk held in the disk magazine is mostly covered with a magazine top-face plate and a magazine inferior-surface-of-tongue plate in the above invention according to claim 9, in case a disk magazine is

detached and attached to a disk unit, there is no possibility of damaging a disk. Moreover, if it extrudes a little in order to remove a disk, a disk periphery will be exposed in a notch. Therefore, it can pull out easily by holding and taking out the exposed disk edge, without touching the signal side with a disk. [0027] a disk discharge lever is prepared rotatable in an opening side face and the opposite side, and it becomes possible for the end of said disk discharge lever to press a disk -- as -- the edge of a disk -- contacting -- the other end of said disk discharge lever -- the rotation from the outside -- it is characterized by having exposed so that it may become operational. [in / on a disk magazine according to claim 9 and / in invention according to claim 10 / said case] In the above invention according to claim 10, by operating and rotating a disk discharge lever from the outside, a disk can be extruded easily, the disk edge exposed in the notch can be held, and it can pull out easily.

[0028]

[Embodiment of the Invention] [1. The gestalt of the 1st operation implementation of the 1st of gestalt] this invention is explained below with reference to drawing 1 - drawing 42 .

[0029] 1-1. The disk unit of the gestalt of whole configuration 1-1-1. configuration book operation of the gestalt of the 1st operation is constituted by preparing two or more following units on the chassis unit 1 equipped with the case 100 of a disk magazine, as shown in drawing 1 and drawing 2 .

[0030] ** The magazine ejection unit 600 (refer to drawing 13) which divides the magazine case 100 up and down, is prepared on the up-and-down unit 300** up-and-down unit 300 which chooses the disk D of the magazine shift unit 200** purpose which secures a playback tooth space in the meantime, and discharges the drive unit 500** magazine case 100 which was prepared on the swing unit 400** swing unit 400 transferred to the playback tooth space of the divided magazine case 100, and was equipped with optical pickup

Hereafter, these configurations are explained in full detail.

[0031] 1-1-2. Explain the configuration of disk magazine **** and a disk magazine with reference to drawing 3 -6. In addition, the bold arrow in drawing 3 - 6 is the path of insertion of the magazine case 100 to the chassis unit 1. That is, as shown in drawing 3 , it is divided on the tray 110 of five sheets which the interior holds Disk D according to an individual, and holds the magazine case 100 of a thin form. This magazine case 100 is formed in the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 possible [division]. The configuration of each part is as follows.

[0032] ** Each tray 110 which divides the inside of the tray magazine case 100 is the member of light-gage discoid, as shown in drawing 4 . Two tray support pawls 111 projected outside are formed in two places (edge under drawing Nakagami) to which that periphery counters this tray 110. Inside two tray support pawls 111 in the inferior surface of tongue of a tray 110, the planet gear 112 is attached rotatable, respectively. Disk support pawl 112a which supports the inferior surface of tongue of the disk D with which the tray 110 was equipped is prepared in these two planet gears 112.

[0033] The lobe 116 projected outside is formed in the edge of the magazine path of insertion (the direction of an arrow head of drawing 4) in a tray 110. Gear slot 116a is formed in the edge of this lobe 116. And the wave-like 1st slot 114 is formed between the lobe 116 and the tray support pawl 111 of the near. Moreover, the wave-like 2nd slot 115 is formed near this and the tray support pawl 111 of the side which counters.

[0034] Furthermore, the specification part 113 of the shape of radii which the periphery of Disk D contacts is formed in the semicircle part on the left-hand side of drawing 4 in a tray 110. And another tray support pawl 111 is formed near the pars intermedia of this semicircle part.

[0035] ** Explain the configuration of the magazine top-face section magazine top-face section 120 with reference to drawing 5 . In addition, drawing 5 is the perspective view which looked up at the magazine top-face section 120 from the background. That is, the magazine top-face section 120 is constituted by the top-face plate 121 and the side-face plate 122. The top-face plate 121 is a plate which formed abbreviation square-like one corner in the shape of radii. The side-face plate 122 is a plate of a cross-section L typeface, and is formed in three corners except a radii-like corner. Inside these three side-face plates 122, side-attachment-wall 122a of the shape of a curved surface which the perimeter of a tray 110 contacts is formed.

[0036] And the top slit section 123 which supports a tray 110 to the magazine top-face section 120 side is formed in the location corresponding to three corners at the top-face plate 121. Slit 123a in which three tray support pawls 111 of each tray 110 are inserted, respectively is formed in the besides side slit section 123. The number of slit 123a is the number of sheets and the same number (the gestalt of this operation five) of a tray 110.

[0037] The maximum upper case is formed for a long time among such slit 123a compared with other stages. Furthermore, gear slot 123c to which a planet gear 112 engages with each partition 123b is formed in the two (drawing 5 is located up and down) slit sections 123 which counter. This gear slot 123c is prepared near the edge of the opposite side with the open end in which the tray support pawl 111 is inserted.

[0038] Moreover, the tray hold arm 124 is formed rotatable inside [on the other hand / (lower part of drawing 5)] the side-face plate 122 which counters the top-face plate 121. This tray hold arm 124 is torsion coiled-spring 124a Depended, and is energized in the direction in which that tip engages with the 1st slot 114 of a tray 110.

[0039] And the disk discharge lever 125 for discharging the disk D held between each tray 110 according to an individual with hand control is formed in the corner of the side (left of drawing 5) which counters the corner of the shape of radii in the top-face plate 121. The number of these disk discharge levers 125 is the number of disk hold, and the same number (the gestalt of this operation five). The disk discharge lever 125 is formed rotatable respectively independently, and the tip is energized by extension spring 125a in the direction which separates from Disk D.

[0040] Furthermore, near the tray hold arm 124 in the top-face plate 121, and the disk discharge lever 125, the guide hole 126 in which two guide shafts 3 mentioned later, respectively are inserted is formed.

[0041] ** The magazine inferior-surface-of-tongue section magazine inferior-surface-of-tongue section 130 is constituted by the top-face plate 121 and the inferior-surface-of-tongue plate 131 of the same configuration as shown in drawing 6 . The bottom slit section 132 which holds a tray 110 to the magazine inferior-surface-of-tongue section 130 side, respectively is formed in the location corresponding to the three top slit sections 123 by the side of the magazine top-face section 120 at the inferior-surface-of-tongue plate 131. Same number formation of the slit 132a in which the tray support pawl 111 of each tray 110 is inserted is carried out with the number of sheets of a tray 110 at this bottom slit section 132. Slit 132a of the maximum upper case is short formed among this slit 132a compared with other stages.

[0042] Such five slit 132a of the bottom slit section 132 constitutes five steps of slits which continued horizontally with slit 123a of the top slit section 123, when it is in the condition that the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 coalesced, as shown in drawing 7 .

[0043] Moreover, the disk hold arm 133 is formed in the corner of the magazine path of insertion (the direction of an arrow head of drawing 6) in the magazine inferior-surface-of-tongue section 130 rotatable. In the tray hold arm 124 in the magazine top-face section 120, this disk hold arm 133 is located in the opposite side, and is energized in the direction in which that tip engages with the 2nd slot 115 of a tray 110 by torsion coiled spring 133a. Furthermore, rectangle-like hollow 131a is formed in the location which visited the magazine path of insertion in the outsole side of the inferior-surface-of-tongue plate 131.

[0044] 1-1-3. a magazine shift unit -- raise the magazine top-face section 120 of the above configurations, and explain the configuration of the magazine shift unit 200 which divides the magazine case 100 according to drawing 8 - drawing 12 . In addition, let the upper part of drawing 8 into back, and let a lower part be the front. This magazine shift unit 200 is constituted by the magazine electrode holder 210, the cylindrical cam 220, the synchro gear 230, and the magazine shift plate 240 grade. The configuration of each part is as follows.

[0045] ** It is the member crooked in cross-section horseshoe-shaped in the plate, and the top face is formed in the almost same configuration as the magazine top-face section 121 so that the magazine electrode-holder magazine electrode holder 210 may cover the top-face plate 121 and both its side of the

magazine top-face section 120, as shown in drawing 8 and drawing 11. this magazine electrode holder 210 -- the inside of the chassis unit 1 -- up and down -- a slide -- it is prepared movable.

[0046] The frame-like magazine insertion opening 2 is formed in the anterior part of the chassis unit 1 so that the front end of the magazine electrode holder 210 may be surrounded. One guide shaft 3 projected perpendicularly is being caudad fixed to the head-lining side of this magazine insertion opening 2 at a time by right and left. And when the magazine electrode holder 210 moves up and down, two insertion hole 210a which the two above-mentioned guide shafts 3 insert in by non-contact, respectively is formed in the top face of the magazine electrode holder 210. Moreover, inside the side face of right and left of the magazine electrode holder 210, bottom grasping pawl 210b which grasps the inserted top-face plate 121 of the magazine top-face section 120 is prepared.

[0047] On the other hand, bottom grasping pawl 2a which grasps the inserted inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130 is prepared in the medial surface of right and left of the magazine insertion opening 2 in the chassis unit 1. In addition, return section 210c opened outside and 2b are formed in the front end of the magazine electrode holder 210 with which the magazine case 100 is inserted, and the front end of the base of the magazine insertion opening 2.

[0048] And as shown in drawing 12 and drawing 8, two are prepared in the right lateral of the magazine electrode holder 210, and one electrode-holder guide pin 211 is formed in the left lateral. right-hand side electrode-holder guide slot 1a by which two right-hand side electrode-holder guide pins 211 were formed in the chassis unit 1 -- a slide -- it is inserted in movable. Two trains of this right-hand side electrode-holder guide slot 1a are formed perpendicularly at the right lateral of the chassis unit 1. left-hand side electrode-holder guide slot 2c by which one left-hand side electrode-holder guide pin 211 was formed in the magazine insertion opening 2 -- a slide -- it is inserted in movable. One train of this left-hand side electrode-holder guide slot 2c is formed perpendicularly at the left lateral of the magazine insertion opening 2.

[0049] Furthermore, as shown in drawing 9 and drawing 11, the tray guide 212 is formed in the posterior part of the magazine electrode holder 210. This tray guide 212 is the member of an inverted-L character form, and screw stop immobilization of the part for that horizontal level is carried out on the top face of the magazine electrode holder 210. Slit 212a corresponding to the number of trays 110 is formed in the perpendicular part of the tray guide 212, and it has at it the composition that the lobe 116 of each tray 110 which rotated to each slit 212a enters.

[0050] ** The cylindrical-cam cylindrical cam 220 is formed in the left side of the magazine insertion opening 2 in the chassis unit 1 rotatable centering on the vertical shaft, as shown in drawing 8 and drawing 9. Spiral cam 220a is formed in the perimeter of a cylindrical cam 220, and the electrode-holder guide pin 211 of the magazine electrode holder 210 is engaging with this spiral cam 220a. Moreover, worm-gear 220b is formed in the perimeter of the lower part of a cylindrical cam 220. This worm-gear 220b constitutes the worm gear by engaging with worm 221a which tells the driving force of the magazine shift motor 221 attached in the chassis unit 1. Furthermore, disc-like gear 220c which is a spur gear is formed in the lowest edge of a cylindrical cam 220.

[0051] ** The synchro gear synchro gear 230 is constituted by the 1st disk section 231 and the 2nd disk section 232 which were prepared in the outsole side of the chassis unit 1 as shown in drawing 8. The 1st disk section 231 and the 2nd disk section 232 adjoin right and left, and are arranged, and the core is established in them rotatable as a shaft, respectively. While circular gear 231a which engages with disc-like gear 220c of a cylindrical cam 220 is formed in the 1st disk section 231, circular gear 231b is formed in the location which counters this circular gear 231a.

[0052] While circular gear 232a which engages with circular gear 231b of the 1st disk section 231 is formed in the 2nd disk section 232, circular gear 232b is formed in the location which counters this circular gear 232a. In addition, the amount of rotation is regulated so that engagement of the circular gears 231b and 232a may not separate from the 1st disk section 231 and the 2nd disk section 232.

[0053] ** it is shown in the right lateral of the magazine SHIFUTOPURETO chassis unit 1 at drawing 8 and drawing 12 -- as -- the magazine shift plate 240 -- order -- a slide -- it is prepared movable. Two inclination cam dies 242 are mutually formed in the vertical plane of this magazine shift plate 240 in

parallel. An inclination cam die 242 has the shape of a straight line which inclined from the front, respectively so that it might become low according to back. and -- this inclination cam die 242 -- the electrode-holder guide pin 211 of the magazine electrode holder 210 -- a slide -- it is inserted in movable.

[0054] Moreover, as the lower limit of the magazine shift plate 240 is shown in drawing 8, it has the horizontal plane crooked in accordance with the angle of the base of the chassis unit 1, and the rack 241 for a magazine shift is formed in ***** of this horizontal plane. This rack 241 for a magazine shift is engaging with circular gear 232b in the 2nd disk section 232.

[0055] 1-1-4. In order to choose the disk D which carries out up-and-down unit playback, explain the configuration of the up-and-down unit 300 which determines the division location of the magazine case 100 according to drawing 13 - drawing 20. In addition, let the upper part of drawing 13 into back, and let a lower part be the front. This up-and-down unit 300 is constituted by the loading gear 310, the post-shift plate 320, the link plate 330, the left shift plate 340, the up-and-down chassis 350, and the drive unit 360 grade. The configuration of each part is as follows.

[0056] ** The loading gear loading gear 310 is formed in the back right corner of the base of the chassis unit 1, as shown in drawing 13. upper case gear 310a which is the intermittent gear whose toothless part is about 3/4 yen as this loading gear 310 is shown in drawing 14, and the middle where the spur gear was formed in the perimeter -- gear 310b and lower-berth gear 310c which is the intermittent gear whose toothless part is semicircle extent have three-step composition constituted by one. and the driving force of the loading motor 311 attached in the chassis unit 1 -- transfer gear group 311a -- minding -- the middle -- it has composition transmitted to gear 310b.

[0057] ** a back side face [in / as the shift-after back shift plate plate 320 is shown in drawing 13 / the chassis unit 1] -- right and left -- a slide -- it is prepared movable. After this, the lower limit of the shift plate 320 has the horizontal plane crooked in accordance with the angle of the base of the chassis unit 1, and the rack 321 for an up-and-down shift is formed in the first transition of this horizontal plane. This rack 321 for an up-and-down shift is formed in the height which engages with lower-berth gear 310c of the loading gear 310. Furthermore, as shown in the rear view of drawing 15, the posterior part stair-like cam 322 of two articles which becomes low according to the left (from the left to the right [Seeing from a transverse-plane side.]) is formed in the vertical plane of the post-shift plate 320 from the right.

[0058] ** As the link plate link plate 330 is shown in drawing 13, it is a sector member and the top-most-vertices section 331 is attached in the outsole side of the chassis unit 1 rotatable. Moreover, the back edge of the radii part of the link plate 330 is connected with the left end section of the horizontal plane in the post-shift plate 320 rotatable.

[0059] ** the left shift plate left shift plate 340 is shown in drawing 13 -- as -- the left side face of the chassis unit 1 -- order -- a slide -- it is prepared movable. This left shift plate 340 has the horizontal plane crooked in accordance with the angle of the base of the chassis unit 1, and the front edge of the radii part of the link plate 330 is connected with the back end of this horizontal plane rotatable. As shown in drawing 16, the left part stair-like cam 341 of one articles which becomes low according to back is formed in the vertical plane in the left shift plate 340 from the front.

[0060] ** The up-and-down chassis up-and-down chassis 350 is the plate of the horizontal plane of an abbreviation L typeface over the left part from the back side of the chassis unit 1, as shown in drawing 13. the configurations with this following up-and-down chassis 350 -- the inside of the chassis unit 1 -- up and down -- a slide -- it is prepared movable. That is, as shown in drawing 15, the vertical plane along the back side face of the chassis unit 1 is formed in the posterior part of the up-and-down chassis 350, and two up-and-down guide pins 351 are formed in this vertical plane. the posterior part stair-like cam 322 of two articles by which these two up-and-down guide pins 351 were formed in the post-shift plate 320 -- respectively -- a slide -- it is inserted in movable.

[0061] Moreover, as shown in drawing 16, the vertical plane which met the left lateral of the chassis unit 1 is formed in the left part of the up-and-down chassis 350, and one up-and-down guide pin 351 is formed in this vertical plane. the left part stair-like cam 341 of one articles by which this up-and-down guide pin 351 was formed in the left shift plate 340 -- a slide -- it is inserted in movable.

[0062] ** On the above drive unit up-and-down chassis 350, as shown in drawing 17 and drawing 18, the drive unit 360 which rotates a tray 110 is formed. This drive unit 360 is constituted by a drive motor 361, the transfer gear group 362, the mode gear 363, the brush switch 364, the cam gear 365, the tray gear 366, and the tray gear arm 367 grade.

[0063] The transfer gear group 362 consists of two or more gears which transmit the driving force of a drive motor 361 to the mode gear 363. The mode gear 363 is a disc-like spur gear which transmits the driving force from the transfer gear group 362 to the cam gear 365. and it is shown in drawing 19 -- as -- this mode gear 363 -- this and the same axle -- and the brush switch 364 which synchronizes and rotates is formed. Contact v-z of the brush switch 364 is set up so that it can detect which phase has actuation of equipment according to the rotation location of the mode gear 363. The completion of transfer of the swing chassis 420 and y support to release of the disk D of disk support pawl 112a, and, specifically, z supports [the standby condition that the swing chassis 420 is standing by / v /, and w / lock discharge of the magazine case 100 and x] floating lock discharge of the drive base 510.

[0064] As the cam gear 365 is shown in drawing 20, disc-like up gear 365a which is a spur gear, and lower gear 365b which has the two toothless sections and which is an intermittent gear are constituted by one. Up gear 365a is engaging with the mode gear 363. Moreover, ring-like of operation cam-groove 365c is formed in the top face of up gear 365b. This of operation cam-groove 365c has 365d of two U sections which curved to shaft orientations.

[0065] The tray gear 366 is a cylindrical gear of height comparable as the thickness of the magazine case 100, as shown in drawing 17 and drawing 18. This tray gear 366 was formed in the front end of the tray gear arm 367 of L typeface rotatable centering on the vertical shaft, and meshes to up gear 365a of the cam gear 365. The back end of the tray gear arm 367 is prepared in the drive unit 360 rotatable. And tray gear arm rotation pin 367a is attached in the tray gear arm 367 near [the] the back end. This tray gear arm rotation pin 367a is engaging with of operation cam-groove 365c of the cam gear 365.

[0066] 1-1-5. Explain the swing unit 400 transferred between the magazine cases 100 by which swing unit division was carried out according to drawing 21 - drawing 22. Let the upper part of drawing 21 into back, and let a lower part be the front. This swing unit 400 is constituted by the power plate 410, the swing chassis 420, and the hold device 430 grade. The configuration of each part is as follows.

[0067] ** the power plate power plate 410 -- the outsole side of the up-and-down chassis 350 -- right and left -- a slide -- it is prepared movable. The rack 411 for a transfer drive which engages with lower gear 365b of the cam gear 365 is formed in the first transition near the right end of this power plate 410. Moreover, near the center section of the power plate 410, the narrow diameter cylinder-like power roller 412 is being fixed. Furthermore, near the left end section of the power plate 410, the cam 413 for a hold drive of a longitudinal direction is formed. This cam 413 for a hold drive has the level difference which shifts to forward and backward in the middle, bordering on this level difference, left-hand side is become to back horizontal level 413a, and right-hand side has become front horizontal level 413b.

[0068] ** The swing chassis swing chassis 420 is the plate of the shape of an abbreviation triangle established on the up-and-down chassis 350. This swing chassis 420 is formed rotatable focusing on the transfer rotation shaft 421 prepared near [that] the right end section. And the hook-like notch 422 is formed in the right end section of the swing chassis 420. The power roller 412 formed in the power plate 410 is engaging with this hook-like notch 422. Moreover, the projection 423 for a hold is formed in the back side face of the swing chassis 420 near [the] the left end section. Furthermore, the contact pawl 424 is formed in the front end section of the swing chassis 420.

[0069] On the other hand, as shown in drawing 22, when the swing chassis 420 is transferred, the V character slit 6 with which the contact section 424 engages is formed in the right lateral of the chassis unit 1. Corresponding to change of the height of the swing chassis 420, two or more steps of this V character slit 6 are formed.

[0070] ** The hold device hold device 430 is constituted by the hold arm 431, the hold link 432, and the hold plate 433 as shown in drawing 21. The hold arm 431 is the plate of L typeface, and the front end is prepared rotatable near the front end section on the up-and-down chassis 350. Hold hole 431a which engages with the projection 423 for a hold of the transferred swing chassis 420 is formed in the back end

of this hold arm 431. Furthermore, the hold arm 431 is energized so that it may rotate clockwise by extension spring 431b. However, as shown in drawing 21, when the swing chassis 420 is in a standby condition, since it is pressed by the left lateral of the swing chassis 420, the energization force of extension spring 431b is resisted, it rotates counterclockwise, and the hold arm 431 is held at the left lateral side of the chassis unit 1.

[0071] The hold link 432 is the plate attached in the outsole side of the up-and-down chassis 420 rotatable. Hold link pin 432a is prepared in the back end of this hold link 432. Hold link pin 432a is inserted in the cam 413 for a hold drive of the power plate 410. Moreover, the left end of the hold link 432 is connected with the back end of the hold plate 433 rotatable.

[0072] the hold plate 433 -- the outsole side of the up-and-down chassis 420 -- order -- a slide -- it is prepared movable. The back end of the rotated hold arm 431 is contacted, and press section 433a to press is prepared in the front end of this hold plate 433.

[0073] 1-1-6. Explain the drive unit 500 which plays the disk D by which drive unit selection was made according to drawing 23 - drawing 26. the upper part of drawing 23 and drawing 25 -- back and a lower part -- before ** -- this drive unit 500 is constituted by the drive base 510, a turntable 520, the optical pickup 530, the delivery device 540, and the floating lock device 550 grade. The configuration of each part is as follows.

[0074] ** The three drive based live bases 510 are supported on the swing chassis 420 by three dampers 511, as shown in drawing 23. One cone projection 510a is prepared in the left lateral of the drive base 510, and two cone projection 510a is prepared in the right lateral. When transferred in the divided magazine case 100, the tray guide projection 512 which contacts the edge of the tray 110 held in the magazine top-face section 120 side is formed in the top face of the back left corner of the drive base 510.

[0075] ** a turntable -- the turntable 520 is attached in such the drive base 510 as shown in drawing 23 and drawing 24 (A). This turntable 520 is formed pivotable by the spindle motor 521. As shown in drawing 24 (B) and (C), the sleeve 522 whose cross section is the barrel of a convex configuration is formed in the perimeter of the revolving shaft on a turntable 520. This sleeve 522 is energized up with the spring 523. The disk insertion section 524 of the shape of a ring inserted in the hole of the center of Disk D is formed in the perimeter of a sleeve 522.

[0076] The disk hook 525 which moors to the hole of the inserted-in disk D and is held is formed in the disk insertion section 524 at intervals of [equal] three. Mooring section 525a which upheaved so that it might moor to the hole of Disk D is formed in the upper limit outside of the disk hook 525. That lower limit section outside is established in this disk hook 525 rotatable as supporting-point 525b.

Furthermore, since the lower limit section of a sleeve 522 has contacted from the lower part inside [lower limit section] the disk hook 525, the disk hook 525 is energized with the spring 523 so that the mooring section 525a may open outside.

[0077] ** As shown in optical pickup, a delivery device, and drawing 23, on the drive base 510, the optical pickup 530 and its delivery device 540 are carried. The optical pickup 530 is the head equipped with the lens 531 grade for reading to optical the information recorded on Disk D. The delivery device 540 is a device in which the slide migration of the optical pickup 530 is made to carry out in the direction of a path of the disk D on a turntable 520. namely, the guide rail 541 and feed screw 542 which have been arranged in parallel mutually -- the optical pickup 530 -- a slide -- it is prepared movable. And the feed screw 542 has pivotable composition according to actuation of the delivery motor 543.

[0078] ** The floating lock device floating lock device 550 is a device which locks floating of the drive base 510 supported by the absorber 511, as shown in drawing 25. This floating lock device 550 is constituted by the lock link 551, the 1st lock plate 552, the 2nd lock plate 553, the reverse link 554, and the extension spring 555.

[0079] The lock link 551 is the plate prepared rotatable near the hook-like notch 422 in the swing chassis 420. The posterior part right end of this lock link 551 is established in the location which contacts the power roller 412 of the power plate 410. The front end of the lock link 551 is connected with the right end section of the 1st lock plate 552 rotatable.

[0080] this 1st lock plate 552 -- the swing chassis 420 top -- right and left -- a slide -- it is the plate prepared movable. And the vertical plane started perpendicularly is formed in the right-hand side edge of the 1st lock plate 552. Lock hole 552a which two cone projection 510a on the right-hand side of the drive base 510 inserts in is formed in this vertical plane. Moreover, between two lock hole 552a of a vertical plane, tray guide side 552b which contacts the edge of a tray 110 at the time of rotation of the tray 110 in the magazine case 100 is prepared.

[0081] the direction where the 2nd lock plate 553 is parallel to the 1st lock plate 552 on the swing chassis 420 on the other hand -- a slide -- it is prepared movable. The vertical plane started perpendicularly is formed in the left-hand side edge of the 2nd lock plate 553. Lock hole 553a which one cone projection 510a on the left-hand side of the drive base 510 inserts in is formed in this vertical plane.

[0082] And between the 1st lock plate 552 and the 2nd lock plate 553 in the swing chassis 420, the reverse link 554 is formed rotatable. The back end of this reverse link 554 is connected with the 1st lock plate 552 rotatable. The front end section of the reverse link 554 is inserted in concave notch 553b prepared in the 2nd lock plate 553. Therefore, since actuation of the 1st lock plate 552 is transmitted to the 2nd lock plate 553 as a motion of hard flow through the reverse link 554, two lock plates 552,553 interlock and have composition which carries out slide migration to hard flow.

[0083] Furthermore, since Hooks 552c and 553c are formed in the swing chassis 420 and the 2nd lock plate 553, respectively and the both ends of an extension spring 555 are engaging with these hooks 552c and 553c, it is energized in the direction close to the 2nd lock plate 553 and the 1st lock plate 552.

[0084] In addition, the arrangement of the floating lock device 550 in a floating lock condition and the drive base 510 is as follows. That is, the drive base 510 is arranged between the vertical planes of the 1st lock plate 552 on the swing chassis 420, and the 2nd lock plate 553. And since the vertical plane of the 1st lock plate 552 and the 2nd lock plate 553 is energized by the energization force of an extension spring 555 in the direction approached mutually, as shown in drawing 26 (A) and (B), cone projection 510a of the drive base 510 is inserted in the lock holes 552a and 553a of each vertical plane. Therefore, the motion is regulated by the lock holes 552a and 553a in which cone projection 510a was inserted while the drive base 510 is grasped by the vertical plane of the 1st lock plate 552 and the 2nd lock plate 553 from both sides.

[0085] 1-1-7. Explain the magazine ejection unit 600 for discharging the magazine ejection unit magazine case 100 from the chassis unit 1 below according to drawing 13 . In addition, let the upper part of drawing 13 into back, and let a lower part be the front. This magazine ejection unit 600 is constituted by the loading plate 610, the loading arm 620, and the extrusion member 630. The configuration of each part is as follows.

[0086] ** the loading plate loading plate 610 -- the outsole side of the chassis unit 1 -- right and left -- a slide -- it is the plate of the abbreviation L typeface prepared movable. Near the back right end section of a loading plate 610, the small rack 611 which engages with upper case gear 310a of the loading gear 310 is formed. Moreover, the abbreviation rectangle-like clipping section 612 is formed in the anterior part of a loading plate 610. Crevice 612a is formed in the posterior part right corner in this clipping section 612, and hook 612b is formed in the anterior part right corner.

[0087] ** The loading-arm loading arm 620 is attached in the location which laps with the loading plate 610 in the outsole side of the chassis unit 1 rotatable. The press pawl 621 is formed in the right end of this loading arm 620. Near the revolving shaft of a loading arm 620, the heights 622 which engaged with crevice 612a of a loading plate 610 are formed. The hook 623 is formed in the left of the heights 622 in a loading arm 620. The both ends of an extension spring 640 are engaging with hook 612b of a loading plate 610, and the hook 623 of a loading arm 620. And the left end of a loading plate 610 is connected with the back end of the extrusion member 630 rotatable.

[0088] ** the extrusion member extrusion member 630 -- the chassis unit 1 -- order -- a slide -- it is prepared movable. When the magazine case 100 is inserted, the catch section 631 which engages with hollow 131a of the outsole side of the magazine inferior-surface-of-tongue section 130 is formed in the front end section of this knockout member 630.

[0089] 1-1-8. The switch and sensors for switching starting of the magazine shift motor 221, the loading motor 311, a drive motor 361, a spindle motor 521, and delivery motor 543 grade to the arrangement pan of switches at the chassis unit 1 are arranged as follows.

[0090] That is, as shown in drawing 27, the loading start switch 10 is formed behind [right lateral] the chassis unit 1. This loading start switch 10 is a switch which detects the inserted magazine case 100 having drawn and having come to the starting position by contacting the press pawl 621 of a loading arm 620. Moreover, on the back chassis unit 1, ejection and a switch 11 are formed rather than the loading start switch 10. This ejection and switch 11 are a switch which detects the completion of discharge of the magazine case 100 by contacting the press pawl 621.

[0091] Moreover, the magazine closing switch 12, the chucking switch 13, and the magazine opening switch 14 are formed in the right lateral of the chassis unit 1 from the front. These are switches which detect the height of the magazine electrode holder 210 from the location of the magazine shift plate 240. That is, the height of the magazine electrode holder 210 is set as the three-stage of a magazine insertion discharge location (the minimum location), a disk chucking location (mid-position), and a magazine open position (the highest location). And corresponding to the location of these magazine electrode holders 210, each above-mentioned switch is arranged so that it may become detectable about each location of the magazine shift plate 240. The magazine closing switch 12 is a switch which detects the minimum location, the chucking switch 13 is a switch which detects the mid-position, and, specifically, the magazine opening switch 14 is a switch which detects the highest location.

[0092] And on the left-hand side of the chassis unit 1, the photosensor 15 which detects rise and fall of the up-and-down chassis 350, and the standby switch 16 which detects that the swing unit 400 transfers and it is in a front standby condition are formed from the back.

[0093] 1-2. an operation of the gestalt of the 1st operation -- the outline of the above actuation of the gestalt of this operation is as following A-L.

[0094] [A] If a user inserts the magazine case 100 from the magazine insertion opening 2 of the chassis unit 1, the magazine case 100 will be drawn by the magazine ejection unit 600 in the chassis unit 1 (magazine loading actuation).

[0095] [B] By the up-and-down unit 300, raise the up-and-down chassis 350 and choose the division location of the magazine case 100 (disk selection actuation).

[0096] [C] By the tray gear 366 of the drive unit 360, rotate a tray 110 and cancel the lock of the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 (magazine lock discharge actuation).

[0097] [D] By the magazine shift unit 200, the magazine electrode holder 210 is raised, raise the magazine top-face section 120, divide the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 up and down, and secure the transfer tooth space of the swing unit 400 (magazine division actuation).

[0098] [E] Transfer the swing chassis 420 by the swing unit 400 between the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 (swing unit transfer actuation).

[0099] [F] Drop the magazine electrode holder 210 by the magazine shift unit 200, and set the disk D held at the tray 110 of the bottom in the magazine top-face section 120 on a turntable 520 (disk chucking actuation).

[0100] [G] By the magazine shift unit 200, raise the magazine electrode holder 210 and secure the playback tooth space of Disk D (magazine evacuation actuation).

[0101] [H] The floating lock by the floating lock device 550 is canceled, and let the drive base 510 be floating (floating lock discharge actuation).

[0102] The disk D on a turntable 520 is played by the [I] optical pickup 530 (disk playback actuation).

[0103] [J] Raise the magazine electrode holder 210 and release a tray 110 from on a turntable 520, after dropping the magazine electrode holder 210 by the magazine shift unit 200 and holding the disk D on a turntable 520 on a tray 110 again (disk re-receipt actuation).

[0104] [K] Shake out the swing chassis 420 by the swing unit 400 from between the magazine top-face section 120 and the magazine inferior-surface-of-tongue sections 130 (swing unit start actuation).

[0105] [L] Drop the magazine electrode holder 210 and make the magazine top face 120 and the magazine inferior-surface-of-tongue section 130 coalesce by the magazine shift unit 200 (magazine coalesce actuation).

[0106] [M] Drop the up-and-down chassis 350 and return to an initial valve position (up-and-down chassis downward actuation).

[0107] [N] Discharge the magazine case 100 from the magazine insertion opening 2 by the magazine ejection unit 600 (disk discharge actuation). Hereafter, these actuation is explained in full detail.

[0108] 1-2-1. The magazine case 100 with which the magazine insertion actuation ** magazine coalesce condition chassis unit 1 is equipped is in the lock condition that division with the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 was regulated, as shown in drawing 28 . That is, as partition 123b which constitutes the top slit section 123 of the maximum upper case is shown in drawing 7 , it is formed for a long time than other stages, and partition 132b which constitutes the bottom slit section 132 corresponding to this is formed shorter than slit 123a of other stages. For this reason, as for the boundary part of the top slit section 123 and the bottom slit section 132, the maximum upper case has shifted to the direction of the under-surface [than other stages] slit section 132.

[0109] Since it has this composition, in the condition, i.e., the condition that all the tray support pawls 111 have visited the direction of the bottom slit section 132, before rotating a tray 110, only the tray support pawl 111 of the maximum upper case was located ranging over the boundary of the top slit section 123 and the bottom slit section 132, and the tray support pawl 111 of the lower berth is completely contained in the bottom slit section 132 side. Thus, since it is regulated that both the slit section 123,132 shifts in the vertical direction by straddling the boundary of the top slit section 123 and the bottom slit section 132, the tray support pawl 111 of the maximum upper case is in the lock condition which the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 cannot divide up and down.

[0110] Moreover, since the tip of the disk hold arm 133 engages with the 1st slot 114 of each tray 110 and the tip of the tray hold arm 124 is engaging with the 2nd slot 115, the rotation is regulated and the lock condition is held. In this magazine case 100, Disk D is inserted corresponding to each tray 110, and the inferior surface of tongue of each disk D is held by disk support pawl 112a of a planet gear 112. Since the tip of the disk hold arm 133 is in contact with the edge of Disk D, the elutriation of Disk D is prevented.

[0111] In addition, the ejection activity of Disk D is as follows. That is, when a user energizes with a finger the edge (right end section in drawing 28) of the disk discharge lever 125 prepared corresponding to each tray 110 to the front, the disk discharge lever 125 is rotated clockwise. Then, since the corresponding disk D is extruded by the edge (left end section in drawing 28) of the disk discharge lever 125 from the magazine case 100, a user pulls out the disk D.

[0112] ** In the initial state which is not inserting initial-state **** and the magazine case 100, as shown in drawing 13 , the extrusion member 630 is ahead and the small rack 611 of a loading plate 610 has got into gear to upper case gear 310a of the loading gear 310. The rack 321 for an up-and-down shift of the post-shift plate 310 is in the toothless part of lower-berth gear 310c of the loading gear 310, and is in the condition of not being engaged.

[0113] ** in the condition of ***** of a magazine case, as shown in drawing 13 , when the magazine case 100 was inserted from the magazine insertion opening 2 of the chassis unit 1 towards the corner of the shape of the radii serving as a method of the left rear, the catch section 631 of the extrusion member 630 was formed in the inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130 -- become depressed and engage with 131a. Moreover, as shown in drawing 10 and drawing 11 , the edge of right and left of the magazine top-face section 120 is inserted between the magazine electrode holder 210 and its bottom grasping pawl 210b, and the edge of right and left of the magazine inferior-surface-of-tongue section 130 is inserted between the chassis unit 1 and bottom grasping pawl 2a.

[0114] ** If the magazine case 100 is back stuffed into a loading initiation pan, since the extrusion member 620 will carry out slide migration in back and will press the left end of a loading arm 620 back,

a loading arm 620 rotates clockwise. Then, since the press pawl 621 at the right end of a loading arm 620 presses the loading start switch 10 of the right lateral of the chassis unit 1, the loading motor 311 starts. the driving force of the loading motor 311 -- transfer gear group 311a -- minding -- the middle -- since it is transmitted to gear 310b, the loading gear 310 rotates clockwise.

[0115] As mentioned above, since upper case gear 310a of the loading gear 310 is engaging with the small rack 611 of a loading plate 610, a loading plate 610 carries out slide migration of it leftward by rotation of the clockwise rotation of the loading gear 310. Then, since crevice 612a of a loading plate 610 energizes the heights 622 of a loading arm 620 leftward, a loading arm 620 rotates further clockwise and moves the extrusion member 630 back. Therefore, as shown in drawing 29, the catch section 631 which engaged with hollow 131a draws the magazine case 100 back further.

[0116] ** Since the toothless part of upper case gear 310a of the loading gear 310 will face to the small rack 611 of a loading plate 610 when the loading completion extrusion member 630 arrives at the last edge, a loading plate 610 suspends slide migration and a loading arm 620 remains in a loading completion location.

[0117] Thus, if equipped with the magazine case 100 in the chassis unit 1, as shown in drawing 30, the edge of the tray 110 in the magazine case 100 will contact tray guide side 552b prepared in the 1st lock plate 552 of a drive unit 500.

[0118] 1-2-2. the drive of a shift-after disk selection actuation ** plate -- when the loading gear 310 rotates in drawing-in actuation of the above magazine cases 100 further clockwise succeeding, as it is shown in it at drawing 29, the gearing section of lower-berth gear 310c engages with the rack 321 for an up-and-down shift of the post-shift plate 320. Then, since the post-shift plate 320 carries out slide migration rightward, the up-and-down guide pin 351 of the posterior part of the up-and-down chassis 350 is energized up by the posterior part stair-like cam 322 of two articles shown in drawing 15.

[0119] ** Since the back end of the link plate 330 connected with the drive coincidence of a left shift plate at the left end of the post-shift plate 320 is energized rightward, the link plate 330 rotates clockwise. The left shift plate 340 connected with the front end of the link plate 330 is energized back, and carries out slide migration. Therefore, the up-and-down guide pin 351 of the left part of the up-and-down chassis 350 is energized up by the left part stair-like cam 341 of the left shift plate 340 shown in drawing 16.

[0120] ** a rise of an up-and-down chassis and a halt -- as mentioned above, since the up-and-down guide pin 351 is energized up, the up-and-down chassis 350 goes up gradually from the location of the tray 110 of the bottom. And if it is detected by photosensor 15 that the up-and-down chassis 350 came to the location corresponding to the desired tray 110 (here a top to the 3rd step of tray 110), a stop signal will be sent to the loading motor 311, and the loading gear 311 will stop. Therefore, the post-shift plate 320 stops and the up-and-down chassis 350 stops.

[0121] 1-2-3. In the initial state of the magazine lock discharge actuation ** initial-state drive unit 360, as shown in drawing 30, tray gear arm rotation pin 367a of the tray gear arm 367 is in the location from which it separated from 365d of the U sections in of operation cam-groove 365c. Therefore, the tray gear arm 367 was rotated clockwise and the tray gear 366 at the tip of the tray gear arm 367 is separated from gear slot 116a formed in the tray 110 in the magazine case 100. Moreover, since the toothless part of lower gear 365b of the cam gear 365 is facing to the rack 411 for a transfer drive of the power plate 410 as shown in drawing 21, the power plate 420 has stopped.

[0122] ** the rise of a drive unit -- from the above initial states, if disk selection actuation by rise of the up-and-down chassis 350 is performed as mentioned above, the drive unit 360 will go up with a rise of the up-and-down chassis 350. Then, as gear slot 116a of the tray 110 of the stage beyond it indicates it in drawing 30 as gear slot 116a of the desired tray 110 (here a top to the 3rd step of tray 110) further, it counters by the tray gear 366 and non-contact.

[0123] ** Start rotation of a tray, next a drive motor 361, and as shown in drawing 32, rotate the cam gear 365 counterclockwise. Then, since tray gear arm rotation pin 367a goes into 365d of the U sections of of operation cam-groove 365c, the tray gear arm 367 rotates counterclockwise. Then, since the tray gear 366 moves ahead, it gears to gear slot 116a of the tray 110 of three sheets which counters this.

Since the tray gear 366 meshes to up gear 365a of the cam gear 365, the tray gear 366 is clockwise rotated with the rotation to the counterclockwise rotation of the cam gear 365.

[0124] For this reason, the tray 110 of three sheets rotates counterclockwise to coincidence. Since the perimeter of a tray 110 is in contact with side-attachment-wall 122a (drawing 28) prepared in the magazine top-face section 120 side, and tray guide side 552b by the side of a drive unit 550 (drawing 30), rotation is stabilized. And if a tray 110 rotates in this way, the lobe 116 in which the gear slot 116a was formed will go into slit 212a (drawing 8 , drawing 11) of the tray guide 212 corresponding to this.

[0125] ** If the tray 110 of three sheets of the discharge upper case of a lock rotates, the tray support pawl 111 of the perimeter will go into slit 123a of the top slit section 123, as shown in drawing 33 and drawing 34 . Since the tray support pawl 111 of the maximum upper case also moves to the top slit section 123 side from the boundary part of the maximum upper case of the top slit section 123 and the bottom slit section 132 at this time, the member which regulates a gap of the vertical direction of both the slit section 123,132 is lost. Therefore, the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 will be in the condition that the lock was canceled. And since the tray support pawl 111 will be supported by only the top slit section 123, the tray 110 of three sheets which rotated is released from the magazine inferior-surface-of-tongue section 130, is lifted with the magazine top-face section 120, and will be in a possible condition.

[0126] ** a halt of a tray gear -- if a tray 110 carries out specified quantity rotation as mentioned above, as shown in drawing 35 , tray gear arm rotation pin 367a will separate from 365d of the U sections of operation cam-groove 365c. Therefore, since the tray gear arm 367 rotates clockwise and the tray gear 366 moves back, it separates from gear slot 116a of a tray 110. Since the brush switch 364 shown in drawing 19 comes to the magazine lock discharge location w at this time, a drive motor 361 stops by this detection.

[0127] 1-2-4. a rise of a magazine division actuation ** magazine electrode holder -- start the magazine shift motor 221 and rotate a cylindrical cam 220, after canceling the lock condition of the magazine case 100 as mentioned above. Then, if it is formed in the perimeter of a cylindrical cam 220 as shown in drawing 9 , the electrode-holder guide pin 211 on the left of the magazine electrode holder 210 will be energized up by plug-like cam 220a. Disc-like gear 220c of a cylindrical cam 220 makes coincidence rotate the 2nd disk section 232 through the 1st disk section 231. Since the rack 241 for a magazine shift of the magazine shift plate 240 is engaging with circular gear 232b of the 2nd disk section 232, the magazine shift plate 240 carries out slide migration with rotation of the 2nd disk section 232 in back. Therefore, as shown in drawing 12 , <TXF FR=0001 HE=250 WI=080 LX=0200 LY=0300> energization of the electrode-holder guide pin 211 on the right of the magazine electrode holder 210 is done by the inclination cam die 242 formed in the magazine shift plate 240 in the upper part.

[0128] Thus, if the electrode-holder guide pin 211 is energized up, as shown in drawing 36 , the magazine electrode holder 210 will go up even to a magazine open position (the highest location), the location of the magazine shift plate 240 at this time will be detected by the magazine opening switch 14, and the magazine shift motor 221 will stop.

[0129] ** division of a magazine -- as a rise of the above magazine electrode holders 210 shows to drawing 36 and drawing 37 , although the magazine top-face section 120 grasped by bottom grasping pawl 210b is raised with the tray 110 of three sheets, since the magazine inferior-surface-of-tongue section 130 is grasped by bottom grasping pawl 2a of the chassis unit 1, it remains caudad with the tray 110 of two sheets. Therefore, the magazine case 100 will be divided up and down in the interior of the chassis unit 1.

[0130] Since the guide shaft 3 inserts in insertion hole 210a of the magazine electrode holder 210 and is further inserted in the guide hole 126 of the magazine top-face section 120 at this time, the longitudinal slide movement of the magazine top-face section 120 is regulated. And as for the tray 110 of three sheets lifted with the magazine top-face section 120, the lobe 116 is contained in slit 212a of the tray guide 212. Therefore, if the support around each tray 110 is totaled with the support for three tray support pawls 111, it will be supported four points and will not hang down in the specific direction.

[0131] 1-2-5. Start the drive motor 361 of the drive unit 360 again after the completion of division of the

rotation magazine case 100 of a swing unit transfer actuation ** swing chassis, and rotate the cam gear 365 counterclockwise. Then, since the gear slot of lower gear 365b in the cam gear 365 gears to the rack 411 for a transfer drive of the power plate 410 as shown in drawing 21, the power plate 410 carries out slide migration leftward. Since the power roller 412 is engaging with the hook-like notch 422 of the swing chassis 420, with the power roller 412 which moves to the left with the power plate 410, the swing chassis 420 is energized and counterclockwise rotation is started centering on the transfer rotation shaft 421.

[0132] If the swing chassis 420 continues rotation, as shown in drawing 38, the swing unit 400 whole will be transferred between the magazine top-face sections 120 and the magazine inferior-surface-of-tongue sections 130 which were divided. And since the contact pawl 424 of the point of the swing chassis 420 engages with the V character slit 6 of the chassis unit 1 (refer to drawing 22), rotation of the swing chassis 420 stops it.

[0133] ** Synchronizing with rotation of the swing chassis 420 of the maintenance above of a swing chassis, as shown in drawing 38, rotate clockwise the hold arm 431 energized by extension spring 431b. If rotation of the swing chassis 420 stops, hold hole 431a at the tip of the hold arm 431 will engage with the projection 423 for a hold of the swing chassis 420. And as shown in drawing 39, the tray guide projection 512 on the drive base 510 contacts the edge of the tray 110 of three sheets held in the magazine top-face section 120.

[0134] Furthermore, as shown in drawing 38, after a rotation halt of the swing chassis 420 carries out slide migration on the left, and the power roller 410 separates from the power plate 410 from the hook-like notch 422. And hold link pin 432a of the hold link 432 goes into front horizontal level 413b on the right-hand side of the cam 413 for a hold drive by slide migration to the left of the power plate 410. Then, since it rotates counterclockwise, the hold plate 433 is energized and slide migration of the hold link 432 is carried out ahead.

[0135] Although the hold arm 431 is rotated clockwise as mentioned above and the edge of the swing chassis 420 is pressed down, press section 433a of the hold plate 433 presses the back end of the hold arm 431. Therefore, since the return to the counterclockwise rotation of the hold arm 431 is regulated and the swing chassis 420 is held still more firmly, backlash is prevented. Since the brush switch 364 shown in drawing 19 at this time comes to the completion location x of transfer, a drive motor 361 suspends it by this detection.

[0136] 1-2-6. The drive unit 500 on the disk chucking actuation swing unit 400 transferred as mentioned above is in a floating lock condition, and as shown in drawing 39, a turntable 520 comes to the location corresponding to the main hole of Disk D. If the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped to a disk chucking location (mid-position) in this condition as shown in drawing 40, the location of the magazine shift plate 240 at this time will be detected by the chucking switch 13, and the magazine shift motor 221 will stop.

[0137] Thus, if the magazine electrode holder 210 descends to the mid-position, the magazine top-face section 120 held at this will also descend. Then, the disk D held at the 3rd step of tray 110 in the magazine top-face section 120 is pushed against a turntable 520, and the disk insertion section 524 inserts in the main hole of Disk D. At this time, as shown in drawing 24 (B) and (C), the disk hook 525 prepared in the disk insertion section 524 also resists the energization force of a spring 523, and rotates inside focusing on supporting-point 525b, and mooring section 525a inserts it in the main hole of Disk D.

[0138] And if this mooring section 525a bends down to pass under a main hole, the disk hook 525 rotates outside according to the energization force of a spring 523, and since mooring section 525a engages with the upper limit of the main hole of Disk D, Disk D will be held on a turntable 520. At this time, as shown in drawing 41, only the 3rd step of tray 110 in the magazine top-face section 120 stands face to face against the tray gear 366.

[0139] 1-2-7. Start a drive motor 361 again after rotation disk chucking completion of a disk release actuation ** tray, and rotate the cam gear 365 counterclockwise. Then, since tray gear arm rotation pin 367a goes into 365d of the U sections of of operation cam-groove 365c in up gear 365a as shown in

drawing 39 , the tray gear arm 367 rotates counterclockwise. Thereby, the tray gear 366 moves ahead and meshes again to gear slot 116a of the 3rd step of tray 110 which counters this. By engagement with up gear 365a, since it is rotating clockwise, a tray 110 rotates the tray gear 366 counterclockwise further. In addition, since the perimeter of a tray 110 is in contact with the tray guide projection 512 of side-attachment-wall 122a of the magazine top-face section 120, and the drive base 510, rotation is stabilized.

[0140] ** Since the planet gear 112 of the both ends of a tray 110 will engage with gear slot 123c of the top slit section 123 as shown in drawing 39 if release of a disk, thus the 3rd step of tray 110 rotate counterclockwise, rotate clockwise. Then, disk support pawl 112a of the planet gear 112 which is supporting Disk D evacuates to the outside of Disk D. Therefore, the perimeter of the disk D by which chucking was carried out on the turntable 520 is released. Since that toothless part of lower gear 365b of the cam gear 365 is facing the rack 411 for a transfer drive of the power plate 410 at this time, the power plate 410 has stopped.

[0141] ** Since tray gear arm rotation pin 367a separates from 365d of the U sections of of operation cam-groove 365c as rotation of the counterclockwise rotation of the cam gear 365 shows to the evacuation pan of a tray gear at drawing 42 , the tray gear arm 367 rotates clockwise. Then, the tray gear 366 moves back and it separates from gear slot 116a of a tray 110. Since the brush switch 364 shown in drawing 19 comes to the disk release location y at this time, a drive motor 361 stops by this detection.

[0142] 1-2-8. magazine evacuation actuation -- if the magazine shift motor 221 is started and the magazine electrode holder 210 is raised to a magazine open position (the highest location) after Disk D is released as mentioned above, the location of the magazine shift plate 240 at this time will be detected by the magazine opening switch 14, and the magazine shift motor 221 will stop.

[0143] If the magazine electrode holder 210 goes up to the highest location again, the magazine top-face section 120 held at this will also go up. Therefore, it leaves the disk D of one sheet by which chucking was carried out on the turntable 520, the tray 110 of three sheets in the magazine top-face section 120 is lifted, and path clearance required for playback of Disk D is secured.

[0144] 1-2-9. If a drive motor 361 is started and the cam gear 365 is counterclockwise rotated, after completing floating lock discharge actuation magazine evacuation actuation, since the gear part of lower gear 365b will engage with the rack 411 for a transfer drive of the power plate 410, the power plate 410 carries out slide migration at a left. Then, since the power roller 412 of the power plate 410 contacts the posterior part right end of the lock link 551 as shown in drawing 25 , the lock link 551 rotates counterclockwise. Since the front end of the lock link 551 energizes the 1st lock plate 552, the 1st lock plate 552 resists the energization force of an extension spring 555, and carries out slide migration of it rightward. Therefore, lock hole 552a in the right-hand side vertical plane of the 1st lock plate 552 releases two cone projection 510a on the right-hand side of the drive base 510.

[0145] Since the back end of the reverse link 554 is energized rightward by such the 1st right translation and coincidence of a lock plate 552, the reverse link 554 is rotated clockwise. Then, since the front end is engaging with concave notch 553b of the 2nd lock plate 553, the 2nd lock plate 553 resists the energization force of an extension spring 555, and carries out slide migration of the reverse link 554 at a left. Therefore, lock hole 553a in the left-hand side vertical plane of the 2nd lock plate 553 releases one cone projection 510a on the left-hand side of the drive base 510. Consequently, the drive base 510 will be in floating by three-point support of only an absorber 511. Since the brush switch 354 shown in drawing 19 comes to the floating lock discharge location z at this time, a drive motor 361 stops by this detection.

[0146] 1-2-10. disk playback actuation -- as mentioned above, rotate the disk D on a turntable 520 by starting a spindle motor 521 after making the drive base 510 into floating. And the delivery motor 543 is started, a feed screw 542 is rotated, and read of the information on Disk D and playback are performed by moving the optical pickup 530 along with a guide rail 541.

[0147] Since the drive base 510 is in floating supported only by the absorber 511, the vibration from the outside is absorbed by the absorber 511, the member of a turntable 520 and optical pickup 530 grade is not influenced by vibration, but the exact read of it becomes possible.

[0148] 1-2-11. Explain the activity which contains again the disk D which ended disk re-receipt actuation playback on the tray 110 in the magazine case 100.

[0149] ** If a drive motor 361 is started and the cam gear 365 is clockwise rotated after suspending rotation of the floating relock actuation turntable 520, the power plate 410 will carry out slide migration at the method of the right by lower gear 365b which engaged with the rack 411 for a transfer drive. Then, since the power roller 412 of the power plate 410 moves rightward as shown in drawing 25, the press to the lock link 551 is solved. The 1st lock plate 552 carries out slide migration leftward according to the energization force of an extension spring 555. Therefore, as shown in drawing 26 (A), lock hole 552a in the right-hand side vertical plane of the 1st lock plate 552 locks cone projection 510a on the right-hand side of the drive base 510.

[0150] Since it can come, simultaneously the back end of the reverse link 554 is energized leftward, the reverse link 554 is rotated counterclockwise. Then, since the energization force of an extension spring 555 works with the energization force of the front end of the reverse link 554, the 2nd lock plate 553 carries out slide migration at the method of the right. Therefore, as shown in drawing 26 (B), lock hole 553a in the left-hand side vertical plane of the 2nd lock plate 553 locks one cone projection 510a on the left-hand side of the drive base 510.

[0151] ** If the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped to a disk chucking location (mid-position) where it carried out the floating lock of the disk re-grasping actuation drive base 510 and a variation rate is regulated, the location of the magazine shift plate 240 at this time will be detected by the chucking switch 13, and the magazine shift motor 221 will stop. Thus, if the magazine electrode holder 210 descends to the mid-position again, the 3rd step of tray 110 of ** in the magazine top-face section 120 will touch the disk D on a turntable 520.

[0152] And if a drive motor 361 is driven succeedingly and the cam gear 365 is rotated clockwise, since tray gear arm rotation pin 367a will go into 365d of the U sections of of operation cam-groove 365a, the tray gear arm 367 rotates counterclockwise. Thereby, the tray gear 366 moves ahead and meshes to gear slot 116a of the 3rd step of tray 110 which counters this. It rotates counterclockwise by engagement with up gear 365a, and the tray gear 366 rotates the tray 110 of three sheets clockwise by this. In addition, since the perimeter of a tray 110 is in contact with side-attachment-wall 122a of the magazine top-face section 120, and the tray guide projection 512, rotation is stabilized.

[0153] Thus, since a planet gear 112 will engage with gear slot 123c of the top slit section 123 as shown in drawing 34 if a tray 110 rotates clockwise, it rotates counterclockwise. Then, disk support pawl 112a goes into Disk D bottom, and supports Disk D. Therefore, the perimeter of the disk D by which chucking was carried out on the turntable 520 is held. Since the toothless part of lower gear 365b is facing the rack 411 for a transfer drive at this time, the power plate 410 has stopped.

[0154] Furthermore, if the cam gear 365 rotates clockwise, since tray gear arm rotation pin 367a will separate from 365d of the U sections of of operation cam-groove 365c, tray gear arm 367a rotates clockwise. Then, the tray gear 366 moves back and it separates from the gear slot 116 of the 3rd step of tray 110.

[0155] ** If the magazine shift motor 221 is started and the magazine electrode holder 210 is raised to a magazine open position (the highest location) in the condition of the disk chucking discharge actuation above, the location of the magazine shift plate 240 at this time will be detected by the magazine opening switch 14, and the magazine shift motor 221 will stop.

[0156] Thus, if the magazine electrode holder 210 goes up to the highest location, the magazine top-face section 120 held at this will also go up. Therefore, the main hole escapes from the disk insertion section 524, and the disk D held by the tray support pawl 111 of the 3rd step of tray 110 goes up with the magazine top-face section 120.

[0157] 1-2-12. swing unit start actuation -- since the gear slot of lower gear 365b will gear on the rack 411 for a transfer drive if the cam gear 365 rotates clockwise after canceling chucking Of Disk D as mentioned above, the power plate 420 carries out slide migration rightward. Then, since the power roller 421 engages with the hook-like notch 422 of the swing chassis 420 again and energizes to the method of the right, the swing chassis 420 transfers and rotation is clockwise started centering on the rotation shaft

421.

[0158] If the swing chassis 420 continues rotation, be shown in drawing 21 . The swing unit 400 whole is shaken out from between the magazine top-face sections 120 and the magazine inferior-surface-of-tongue sections 130 which were divided, and returns to the initial valve position of the method of the left rear of the chassis unit 1.

[0159] Hold link pin 432a of the hold link 432 goes into coincidence by slide migration to the method of the right of the power plate 410 at back horizontal level 423a on the left-hand side of the cam 423 for a hold drive. Then, since it rotates clockwise, the hold plate 433 is energized and slide migration of the hold link 432 is carried out in back.

[0160] Since the front end of the hold plate 433 separates from the hold arm 431 which was pressing down the edge of the swing chassis 420, the energization force of extension spring 431b is resisted with the swing unit 400 which rotates clockwise, it rotates counterclockwise gradually, and the hold arm 431 returns to the location which finally touches the left-hand side edge of the chassis unit 1.

[0161] 1-2-13. descent of a magazine coalesce actuation ** magazine electrode holder -- if the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped even to a magazine insertion discharge location (the minimum location) after the swing unit 400 is shaken out as mentioned above, the location of the magazine shift plate 240 at this time will be detected by the magazine closing switch 12, and the magazine shift motor 221 will stop.

[0162] Thus, the magazine top-face section 120 grasped by the descending magazine electrode holder 210 descends with the tray 110 of three sheets, and coalesces in the magazine inferior-surface-of-tongue section 130 which remained caudad with the tray of two sheets. Since the guide shaft 3 has inserted in insertion hole 210a of the magazine electrode holder 210 at this time, the longitudinal slide movement of the magazine top-face section 120 is regulated, and it coalesces correctly.

[0163] ** If magazine lock actuation and the cam gear 365 rotate further clockwise, since tray gear arm rotation pin 367a will go into 365d of the U sections of of operation cam-groove 365c, the tray gear arm 367 rotates counterclockwise. Then, since the tray gear 366 moves ahead, it gears to gear slot 116a of the tray 110 of three sheets which counters this. By rotation to the clockwise rotation of the cam gear 365, it rotates counterclockwise and the tray 110 of three sheets rotates the tray gear 366 clockwise by this. Since the perimeter of a tray 110 is in contact with side-attachment-wall 122a by the side of the magazine top-face section 120, and tray guide side 552b by the side of a drive unit 550, rotation is stabilized.

[0164] Thus, if a tray 110 rotates, as shown in drawing 28 , the tray support pawl 111 of the perimeter will go into slit 132a by the side of the bottom slit section 132. At this time, as shown in drawing 8 , only the tray support pawl 111 of the maximum upper case was located ranging over the boundary of the top slit section 123 and the bottom slit section 132, and the tray support pawl 111 of that lower berth is completely contained in the bottom slit section 132 side. Therefore, the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 will be in the lock condition which cannot be divided up and down.

[0165] Thus, since tray gear arm rotation pin 367a will separate from 365d of the U sections of of operation cam-groove 365c if the cam gear 365 rotates clockwise succeedingly after the magazine case 100 is in a lock condition, the tray gear arm 367 rotates clockwise. Then, since the tray gear 366 moves back, it separates from gear slot 116a of the tray 110 of three sheets which counters this. Since the brush switch 364 shown in drawing 19 comes to the standby condition v at this time, a drive motor 361 stops by this detection.

[0166] 1-2-14. up-and-down chassis downward actuation -- as mentioned above, start the loading motor 311 and rotate the loading gear 310 counterclockwise, after completing coalesce and the lock of the magazine case 100. Then, the gearing section of lower-berth gear 310c engages with the rack 321 for an up-and-down shift of the post-shift plate 320. Then, since the post-shift plate 320 carries out slide migration leftward, the up-and-down guide pin 351 of the up-and-down chassis 350 is caudad energized by the posterior part stair-like cam 322.

[0167] The link plate 330 connected with the left end of the post-shift plate 320 at coincidence rotates

counterclockwise, and the left shift plate 340 connected with the front end of the link plate 330 carries out slide migration ahead. Therefore, the up-and-down guide pin 351 of the up-and-down chassis 350 is caudad energized by the left part stair-like cam 341 of the left shift plate 340.

[0168] As mentioned above, since the up-and-down guide pin 351 is energized caudad, the up-and-down chassis 350 descends and it returns to the early minimum location. And since the toothless part faces the rack 321 for an up-and-down shift, the post-shift plate 320 stops lower-berth gear 310c of the loading gear 310.

[0169] 1-2-15. Since upper case gear 310a will engage with the small rack 611 of a loading plate 610 as shown at drawing 13 if rotation of the counterclockwise rotation of the loading gear 310 is continued to a magazine ejection actuation pan, a loading plate 610 carries out slide migration rightward. Then, since crevice 612a of a loading plate 610 energizes the heights 622 of a loading arm 620 rightward, a loading arm 620 rotates counterclockwise and moves the extrusion member 630 ahead.

[0170] Since the catch section 631 of the knockout member 630 is engaging with hollow 131a of the magazine inferior-surface-of-tongue section 130, the magazine case 100 is extruded with advance of the extrusion member 630. If specified quantity discharge of the magazine case 100 is carried out from the magazine insertion opening 2, since the press pawl 621 at the left end of a loading arm 620 will press ejection and the switch 11 of the chassis unit 1, the loading motor 311 stops and a loading arm 620 remains in the completion location of discharge. In this condition, a user pulls [a user] out the magazine case 100 from the magazine insertion opening 2.

[0171] 1-3. the effectiveness of the gestalt of the 1st operation -- the effectiveness of the above gestalten of this operation is as follows. Namely, what is necessary is just to form the drive unit 360 which rotates a tray 110, and the up-and-down unit 300 which makes it go up and down the drive unit 360, in order to realize these functions with the top slit section 123 in the magazine case 100 and the bottom slit section 132, and the tray support pawl 111 that moves according to rotation of each tray 110, since the lock of the magazine case 100 and maintenance of a tray 110 are possible. Therefore, according to an easy device, lock of the magazine case 100 and lock discharge, disk selection, and support of a tray 110 can be performed, and a miniaturization and low cost-ization are attained. Since especially rotation of a tray 110 rotates a tray 110 by rotating the tray gear 366 which engages and releases gear slot 123c of a tray 110, it can realize positive actuation according to a simple device.

[0172] Moreover, in the condition that the swing unit 400 is not transferred, since the edge of the tray 110 in the magazine case 100 is in contact with tray guide side 552b of the 1st lock plate 552, rotation of the lock of the magazine case 100 and the tray 110 in the case of lock discharge is stabilized, and dependability improves.

[0173] Moreover, since the lobe 116 of a tray 110 is contained in slit 212a of the tray guide 212 in case you make it go up and down the magazine top-face section 120, four perimeters in all of each tray 110 will be supported with three tray support pawls 111, and do not hang down in the specific direction.

[0174] Moreover, in the condition that the swing unit 400 was transferred, since the edge of the tray 110 in the magazine top-face section 120 is in contact with the tray guide projection 512 of the drive base 510, release of Disk D or rotation of the tray 110 in the case of maintenance is stabilized, and dependability improves.

[0175] Moreover, since disk support pawl 112a of a planet gear 112 which rotates with a tray 110 performs disk maintenance, maintenance of a disk and release can be performed by the simple device.

[0176] Moreover, since the tip of the tray hold arm 124 is engaging with the 1st slot 114 of a tray 110, it is prevented that rotation of a tray 110 is regulated, a tray 110 rotates at the time of carrying of the magazine case 100 etc., and a lock is canceled. Since especially both the slit section 123,132 in the magazine case 100 and the magazine inferior-surface-of-tongue section 130 is formed in three places of tray 110 perimeter, it becomes trustworthy [the above-mentioned lock].

[0177] Moreover, the tip of the disk hold arm 133 engages with the 2nd slot 115 of a tray 110, and since it is in contact with the disk D with which the tray 110 was equipped, the elutriation of Disk D is prevented.

[0178] Moreover, since migration is guided when the guide shaft 3 inserts in the guide hole 126 in case

the magazine top-face section 120 goes up and down with the magazine electrode holder 210, there is no location gap and division and generating of the malfunction at the time of coalesce are prevented.

[0179] Moreover, in order that the depth (before or after) direction and the width-of-face (right and left) direction may not take a comparison-tooth space, it becomes easy to miniaturize [of the whole equipment] the cylindrical cam 220 for making it go up and down the magazine electrode holder 210. In the tooth space which is easy to secure the depth stroke of this and the opposite side to the swing unit 400 side which cannot secure a depth stroke especially easily using a cylindrical cam 220, by using the magazine shift plate 240 which does not take a crosswise tooth space, space-efficient member arrangement is attained and the large miniaturization of the whole equipment can be realized.

[0180] Moreover, since this and the opposite side will be held by the hold arm 431 while the contact pawl 424 at the tip is held by the V character slit 6 if the swing chassis 420 is transferred, three swing chassis 420 will be supported by transfer rotation shaft 425a, the V character slit 6, and the hold arm 431, and become strong to vibration by them. Furthermore, since press section 422a of the hold plate 433 presses the back end of the hold arm 431 at this time, that return is prevented and it is held more firmly.

[0181] Moreover, since chucking of the disk D to a turntable 520 top and a chucking discharge activity can be easily done by making it go up and down the magazine electrode holder 210, and making the disk hook 525 engage and release the main hole of Disk D, the member for pressing down from Disk D specially is not needed, but simplification of a configuration can be realized.

[0182] [2. The gestalt of the 2nd operation implementation of the 2nd of gestalt] this invention is explained below with reference to drawing 43 - drawing 60 . In addition, the same member as the gestalt of the 1st operation of the above attaches the same sign, and omits a part of explanation.

[0183] 2-1. Explain the configuration of configuration 2-1-1. disk magazine **** of the gestalt of the 2nd operation, and a disk magazine. That is, as shown in drawing 43 and drawing 44 , the magazine case 100 is formed in the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 possible [division], and the interior is divided on the tray 110 of five sheets. The configuration of each part is as follows.

[0184] ** As shown in tray drawing 45 , two projections 117 for tray support projected outside are formed in two places to which the periphery counters the tray 110 of light-gage discoid. Inside these two projections 117 for tray support, projection 117a for disk maintenance is formed, respectively. If projection 117a for disk maintenance will project inside, Disk D will be held, if the projection 117 for tray support is pressed, and the press to the projection 117 for tray support is solved, it is prepared possible [elastic deformation] between the projection 117 for tray support, and projection 117a for disk maintenance so that projection 117a for disk maintenance may evacuate outside and Disk D may be released. And another projection 118 for tray support is formed in the periphery of a tray 110 in the middle of two projections 117 for tray support.

[0185] Moreover, between the projection 117 for tray support of one side (lower part in drawing 45), and the middle projection 118 for tray support, another projection 119 for disk maintenance is formed. Suppressed area 119a is formed in the outside of this projection 119 for disk maintenance. And if the projection 119 for disk maintenance will project inside, Disk D will be held, if suppressed area 119a is pressed inside, and the press to suppressed area 119a is solved, it is prepared possible [elastic deformation] between the projection 119 for disk maintenance, and suppressed area 119a so that the projection 119 for disk maintenance may evacuate outside and may release Disk D.

[0186] Gear slot 116a is formed in the side which counters this projection 119 for disk maintenance. Between this gear slot 116a and the projection 117 for tray support of that near, slot 110a for a rotation lock is formed. Moreover, the specification part 113 to which the periphery of Disk D contacts the circular part from the middle projection 118 for tray support to two projections 117 for tray support is formed in the tray 110. Furthermore, flabellate form notch 110b is formed between the middle projection 117 for tray support, and the projection 119 for disk maintenance.

[0187] ** The magazine top-face section magazine top-face section 120 is constituted by the top-face plate 121 and the side-face plate 122 as shown in drawing 46 . Inside three side-face plates 122, side-

attachment-wall 122a and the top slit section 123 are formed. As shown in drawing 47, five steps of slit 123a is formed in the besides side slit section 123, and slit 123a of the maximum upper case is formed in it for a long time compared with other stages.

[0188] And in the two top slit sections 123 which counter, 123d of ridges which upheaved in the direction which goes at the core of Disk D to the medial surface of each slit 123a is formed.

Furthermore, inside the left-hand side side-face plate 122, the press side 127 which contacts suppressed area 119a of a tray 110 is formed between two side-face plates 122 of the lower part in drawing 43 and drawing 46.

[0189] Moreover, as shown in drawing 43 and drawing 45, the tray hold arm 124 prepared in the magazine top-face section 120 is torsion coiled-spring 124a Depended, and is energized in the direction in which the tip engages with slot 110a for a rotation lock of a tray 110. And the disk discharge lever 127 is formed in the location corresponding to flabellate form notch 110b of the tray 110 in the magazine top-face section 120 rotatable. This disk discharge lever 128 is energized by torsion coiled spring 128a in the direction in which that tip separates from Disk D.

[0190] And as shown in drawing 48, the tip of the disk discharge lever 128 corresponded to the height of each tray 110 and is stair-like. Furthermore, the guide hole 126 in which one guide shaft 3 is inserted is formed in the location corresponding to the shaft of the disk discharge lever 128 in the top-face plate 121.

[0191] ** As shown in the inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130 at drawing 49, the three bottom slit sections 132 are formed. And as shown in drawing 50, slit 132a of the maximum upper case is short formed among 5 steps of slit 132a of the bottom slit section 132 compared with other stages.

[0192] 2-1-2. The magazine shift unit magazine shift unit 200 is constituted by the magazine electrode holder 210, the left magazine shift plate 250, the magazine shift link 260, and the right magazine shift plate 270 grade as shown in drawing 51 - drawing 54. The configuration of each part is as follows.

[0193] ** The magazine electrode-holder magazine electrode holder 210 is the almost same configuration as the gestalt of the 1st operation. However, as shown in drawing 51, insertion hole 210a which one guide shaft 3 inserts in by non-contact is prepared in one top face of the magazine electrode holder 210.

[0194] ** the left magazine shift plate left magazine shift plate 250 is shown in drawing 52 -- as -- the left side of the magazine insertion opening 2 -- order -- a slide -- it is prepared movable. One inclination cam die 251 is formed in the vertical plane of this left magazine shift plate 251. This inclination cam die 251 has the shape of a straight line which inclined from the front so that it might become high according to back. and -- an inclination cam die 251 -- the electrode-holder guide pin 211 of the magazine electrode holder 210 -- a slide -- it is inserted in movable.

[0195] Furthermore, the lower limit of the left magazine shift plate 250 has the horizontal plane crooked in accordance with the angle of the base of the chassis unit 1, and the end of the magazine shift link 260 is connected with this horizontal plane rotatable.

[0196] ** As shown in drawing 51, magazine shift RINKUMAGAJINSHIFU Trink 260 is the plate of the shape of a thin rectangle which has the die length of breadth extent of the magazine insertion opening 2, and is attached in the outsole side of the chassis unit 1 rotatable centering on the center. The end of the magazine shift link 260 is connected with the left magazine shift plate 250 rotatable as mentioned above, and the other end is connected with the right magazine shift plate 270 rotatable like the after-mentioned.

[0197] ** the right magazine shift plate right magazine shift plate 270 is shown in drawing 51 and drawing 53 -- as -- the right lateral of the chassis unit 1 -- order -- a slide -- it is prepared movable. The lower limit of the right magazine shift plate 270 has the horizontal plane crooked in accordance with the angle of the base of the chassis unit 1, and is connected with the other end of the magazine shift link 260 rotatable as mentioned above in this horizontal plane.

[0198] Moreover, two inclination cam dies 271 are mutually formed in the vertical plane of the right magazine shift plate 270 in parallel. This inclination cam die 271 has the shape of a straight line which

inclined from the front, respectively so that it might become low according to back. and -- these inclination cam dies 271 -- the electrode-holder guide pin 211 of the magazine electrode holder 210 -- a slide -- it is inserted in movable.

[0199] Furthermore, the rack 272 for a magazine shift is horizontally formed in the back lower limit section of the right magazine shift plate 270. It is engaging with the pinion driven by the magazine shift motor (not shown) on this rack 272 for a magazine shift.

[0200] 2-1-3. Although the up-and-down unit up-and-down unit 300 is the almost same configuration as the gestalt of the 1st operation of the above, it has the following differences.

[0201] ** As shown in drawing 51, the shift cam gear shift cam gears 312 are the loading gear 310 in the gestalt of the 1st operation, and a gear with the same function, and are prepared in the back right corner of the base of the chassis unit 1. the middle this shift cam gear 312 of whose is a small intermittent gear of a path from upper case gear 312a by which the spur gear was formed in the perimeter by the major diameter, and upper case gear 312a -- gear 312b and the middle -- lower-berth gear 312c which is the small intermittent gear of a path has three-step composition constituted by one from gear 312b.

[0202] And upper case gear 312a of the shift cam gear 312 has composition which can transmit the driving force of a loading motor (not shown). moreover, the middle -- gear 312b is prepared in the height corresponding to the rack 321 for an up-and-down shift of the post-shift plate 320.

[0203] ** The drive unit drive unit 370 is constituted by a drive motor 361, the transfer gear 371, the large cam gear 372, the middle gear 373, and the tray gear 374 grade as shown in drawing 51 and drawing 56.

[0204] The transfer gear 371 is a gear which transmits the driving force of a drive motor 361 to the large cam gear 372. The large cam gear 372 constitutes four steps of disc-like gears in one, the maximum upper case transfers, gear 372for driving sources b and the 3rd step are become to gear 372for tray drive c, and the 4th step has become [gear 372for drive a, and the 2nd step] gear 372d for a floating lock drive. Gear 372b for driving sources is a spur gear with a bigger path than other gears, and is engaging with the transfer gear 371.

[0205] Gear 372for transfer drive a and gear 372d for a floating lock drive are intermittent gears which have a radii-like gear part in the one section of a periphery. Gear 372c for a tray drive is an intermittent gear which has the gear part of a periphery short to two places, and the rotation is prepared in the tray gear 374 possible [transfer] through the middle gear 373. furthermore -- the large cam gear 372 -- this and the same axle -- and the brush switch (not shown) which synchronizes and rotates is formed.

[0206] 2-1-4. The swing chassis 425 of the swing unit swing unit 400 is the plate of the shape of an abbreviation triangle established on the up-and-down chassis 350, as shown in drawing 51 and drawing 56. This swing chassis 425 is formed rotatable focusing on transfer rotation shaft 425a near [that] the right end section.

[0207] and it is shown in drawing 56 -- as -- this transfer rotation shaft 425a and same axle -- and transfer rotation gear 425b is prepared rotatable with the swing chassis 425. This transfer rotation gear 425b is the partial gear in which the gear slot was formed at the edge of a brush configuration, and is arranged by the height which can engage with gear 372a for a transfer drive of the upper case of the large cam gear 372.

[0208] 2-1-5. Although the drive unit drive unit 500 is the almost same configuration as the gestalt of the 1st operation of the above, it has the following differences.

[0209] ** As the drive base 510 on the drive base swing chassis 420 is shown in drawing 51 and drawing 56, two places, the anterior part and the right part, are supported by the fixed damper 513, and the back left corner is supported by the movable damper 514. This movable damper 514 is formed in the successive range of optical pickup (not shown), and is laid by un-fixing on the swing chassis 420. And the damper arm 515 is attached in the upper part of the movable damper 514 through damper shaft 514a. This damper arm 515 is a plate with a small waterdrop configuration, an end is prepared on the movable damper 514 and the other end is connected with the corner of the drive base 510 rotatable. Damper arm gear 515a is formed in the perimeter of the other end of this damper arm 515.

[0210] ** The floating lock device floating lock device 550 is constituted by the floating lock gear 556, the 1st lock plate 552, the 2nd lock plate 553, the reverse link gear 554, and the extension spring 555 as shown in drawing 56. the floating lock gear 556 -- transfer rotation shaft 425a of the swing chassis 420, and the same axle -- and they are the swing chassis 420 and the gear prepared rotatable independently.

[0211] This floating lock gear 556 is a partial gear in which the gear slot was formed at the edge of a brush configuration, and is arranged by the height which can engage with gear 372d for a floating lock drive of the 4th step of the large cam gear 372. Furthermore, a part of floating lock gear 556 is connected with the left end section of the 1st lock plate 552 rotatable.

[0212] And between the 1st lock plate 552 and the 2nd lock plate 553 in the swing chassis 420, the reverse link gear 554 is formed rotatable. The both ends of this reverse link gear 554 are engaging with the rack prepared in the 1st lock plate 552 and 2nd lock plate 553. Therefore, since actuation of the 1st lock plate 552 is transmitted to the 2nd lock plate 553 as a motion of hard flow through the reverse link gear 554, two lock plates 552,553 interlock mutually and have composition which carries out slide migration to hard flow.

[0213] Furthermore, since hook 552c is prepared in the 1st lock plate 552 and the both ends of an extension spring 555 are being engaged between this hook 552c and the swing chassis 420, both the lock plates 552,553 are energized in the direction approached mutually.

[0214] Moreover, the damper rotation gear 516 is formed in the back left end section of the drive base 510. The both ends of this damper rotation gear 516 are engaging with the rack prepared in the 2nd lock plate 552, and damper arm gear 515a. Therefore, actuation of the 2nd lock plate 552 is transmitted to damper arm gear 515a through the damper rotation gear 516, and has composition which the damper arm 515 rotates.

[0215] 2-1-6. The magazine ejection unit magazine ejection unit 600 is constituted by the rack plate 650, the catch arm 660, and the extrusion member 630 grade as shown in drawing 51.

[0216] ** the front of the shift cam gear [in / in the rack plate rack plate 650 / the base of the chassis unit 1] 312 -- right and left -- a slide -- it is the plate prepared movable. Rack 650a for loading is formed in the location corresponding to lower-berth gear 312c of the shift cam gear 312 at the posterior part of this rack plate 650. Horseshoe-shaped notch 650b is formed in the anterior part of the rack plate 650.

[0217] ** The catch arm catch arm 660 is the plate prepared ahead of the rack plate 650 in the base of the chassis unit 1. The right end of this catch arm 660 is attached rotatable to the chassis unit 1. Protruding object 660a which engages with notch 650b of the rack plate 650 is formed in the back end near the rotation shaft of the catch arm 660.

[0218] Furthermore, the left end of the catch arm 660 is connected with the back end of the extrusion member 630 rotatable. Moreover, the configuration of the extrusion member 630 is the same as that of the gestalt of the 1st operation. In addition, the loading start switch 10 and ejection which detect the rotation location of the catch arm 660, and a switch 11 are formed like the gestalt of the 1st operation.

[0219] 2-2. an operation of the gestalt of the 2nd operation -- the actuation of the above gestalten of the 2nd operation is as follows.

[0220] 2-2-1. The magazine case 100 with which magazine insertion actuation ** magazine coalesce condition **** and the chassis unit 1 are equipped is in the lock condition that division with the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 was regulated. That is, partition 123b which constitutes the top slit section 123 of the maximum upper case is formed like the gestalt of the 1st operation for a long time than other stages, and partition 132b which constitutes the bottom slit section 132 corresponding to this is formed shorter than slit 123a of other stages. For this reason, as for the boundary part of the top slit section 123 and the bottom slit section 132, the maximum upper case has shifted to the direction of the under-surface [than other stages] slit section 132.

[0221] The condition since it has this composition, as it is shown in drawing 57 (A), before rotating a tray 110, namely, in the condition that all projections 117,118 for tray support have visited the direction of the bottom slit section 132 Only the projection 117,118 for tray support of the maximum upper case was located ranging over the boundary of the top slit section 123 and the bottom slit section 132, and the

projection 117,118 for tray support of the lower berth is completely contained in the bottom slit section 132 side.

[0222] Thus, when the projection 117,118 for tray support of the maximum upper case straddles the boundary of the top slit section 123 and the bottom slit section 132, it is regulated that both the slit section 123,132 shifts in the vertical direction, and it is in the lock condition which the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 cannot divide up and down.

[0223] ** As shown in an initial state and drawing 51 , in the initial state which is not inserting the magazine case 100, the extrusion member 620 is ahead with the left end of the catch arm 660. In this condition, if the magazine case 100 is inserted from the magazine insertion opening 2 of the chassis unit 1 towards the angle of the shape of those radii serving as a method of the left rear, the catch section 631 of the extrusion member 630 will engage with hollow 131a formed in the outsole side of the inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130.

[0224] Furthermore, if the magazine case 100 is pushed in back, since the extrusion member 620 will carry out slide migration in back and will press the left end of the catch arm 660 back, the catch arm 660 rotates clockwise. Then, with the loading start switch 10, the loading motor 311 starts and the shift cam gear 312 rotates counterclockwise.

[0225] As mentioned above, since lower-berth gear 312c of the shift cam gear 312 is engaging with rack 650a for loading of the rack plate 650, the rack plate 650 carries out slide migration of it rightward by rotation of the counterclockwise rotation of the shift cam gear 312. Then, since notch 650a of the rack plate 650 energizes protruding object 660a of the catch arm 660 rightward, the catch arm 660 rotates further clockwise and moves the extrusion member 630 back. Therefore, the catch section 631 which engaged with hollow 131a draws the magazine case 100 back further.

[0226] Since the toothless part of lower-berth gear 312c of the shift cam gear 312 will face to rack 650a for loading of the rack plate 650 when the knockout member 630 arrives at the last edge, the rack plate 650 suspends slide migration and the catch arm 660 remains in a loading completion location. Thus, if equipped with the magazine case 100 in the chassis unit 1, like the gestalt of the 1st operation, the edge of right and left of the magazine top-face section 120 will be grasped by bottom grasping pawl 210b of the magazine electrode holder 210, and the edge of right and left of the magazine inferior-surface-of-tongue section 130 will be grasped by bottom grasping pawl 2a of the chassis unit 1.

[0227] 2-2-2. disk selection actuation -- if the shift cam gear 312 rotates counterclockwise further succeeding to wearing of the above magazine cases 100 -- the middle -- the gearing section of gear 312b engages with the rack 321 for an up-and-down shift of the post-shift plate 320. Then, since the post-shift plate 320 carries out slide migration leftward, as shown in drawing 55 , the up-and-down guide pin 351 of the posterior part of the up-and-down chassis 350 is energized up by the posterior part stair-like cam 322.

[0228] Like the gestalt of the 1st operation, since the link plate 330 energized with the post-shift plate 320 rotates and the left shift plate 340 carries out slide migration ahead, the up-and-down guide pin 351 of the left part of the up-and-down chassis 350 is energized up by the left part stair-like cam 341 of the left shift plate 340 at coincidence.

[0229] Therefore, the up-and-down guide pin 351 is energized up, and the up-and-down chassis 350 goes up. And if it is detected by photosensor 15 that the up-and-down chassis 350 came to the location corresponding to the desired tray 110 (here a top to the 3rd step of tray 110), a stop signal will be sent to the loading motor 311, and the loading gear 311 will stop. Therefore, the post-shift plate 320 stops and the up-and-down chassis 350 stops.

[0230] 2-2-3. The magazine lock discharge actuation ** initial-state tray gear 366 supports gear slot 116a formed in the tray 110 in the magazine case 100, as shown in drawing 51 . And since the toothless part of gear 372c for a tray drive in the large cam gear 372 is faced, the middle gear 373 has stopped the middle gear 373 and the tray gear 366.

[0231] ** the rise of a drive unit -- from the above initial states, if disk selection actuation by rise of the up-and-down chassis 350 is performed, the drive unit 360 will go up with a rise of the up-and-down chassis 350. Then, gear slot 116a of the tray 110 of the stage beyond it engages with gear slot 116a of

the desired tray 110 (here a top to the 3rd step of tray 110) further at the tray gear 366.

[0232] ** Start rotation of a tray, next a drive motor 361, and rotate the large cam gear 372 clockwise. Then, since the gearing part of the gear 372 for a tray drive gears with the middle gear 373 and the middle gear 373 rotates counterclockwise, the tray gear 366 is rotated clockwise. For this reason, the tray 110 of three sheets on which gear slot 116a is engaging with the tray gear 366 rotates counterclockwise to coincidence. At this time, the perimeter of a tray 110 is guided to side-attachment-wall 122a prepared in the magazine top-face section 120 side.

[0233] ** If the discharge tray 110 of a lock rotates, as shown in drawing 57 (B), the projection 117,118 for tray support around each tray 110 will go into slit 123a of the top slit section 123. Since the projection 117,118 for tray support of the maximum upper case also moves to the top slit section 123 side from the boundary part of the maximum upper case of the top slit section 123 and the bottom slit section 132 at this time, the member which regulates a gap of the vertical direction of both the slit section 123,132 is lost. Therefore, the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 will be in the condition that the lock was canceled.

[0234] Since the projection 117,118 for tray support will be supported by only the top slit section 123, the tray 110 of three sheets which rotated is released from the magazine inferior-surface-of-tongue section 130, is lifted with the magazine top-face section 120, and will be in a possible condition. Moreover, since suppressed area 119a is pressed by the press side 127 established in the magazine top-face section 120 while the projection 117 for tray support is pressed inside by 123d of ridges in slit 123a at this time, the projections 117a and 119 for disk maintenance project inside, and hold a disk.

[0235] ** a halt of a tray gear -- since the gearing part of the gear 372 for a tray drive will separate from the middle gear 373 and a toothless part will face if the large cam gear 372 rotates clockwise further after a tray 110 carries out specified quantity rotation as mentioned above, the tray gear 366 stops with the middle gear 373. Therefore, rotation of a tray 110 is also stopped in the state of the above disk maintenance.

[0236] 2-2-4. a rise of a magazine division actuation ** magazine electrode holder -- if a magazine shift motor is started after canceling the lock condition of the magazine case 100 as mentioned above, the right magazine shift plate 270 will carry out slide migration in back. Therefore, as shown in drawing 58, the inclination cam die 271 of the right magazine shift plate 270 energizes the electrode-holder guide pin 211 on the right of the magazine electrode holder 210 up.

[0237] Since the right end of the magazine shift link 260 connected with the right magazine shift plate 270 is back energized as shown in coincidence at drawing 51, the magazine shift link 260 is rotated counterclockwise. Then, as shown in drawing 52, the left magazine shift plate 250 connected with the left end of the magazine shift link 260 is energized ahead, and carries out slide migration. Therefore, the inclination cam die 242 formed in the left magazine shift plate 250 energizes the electrode-holder guide pin 211 on the left of the magazine electrode holder 210 up.

[0238] Thus, if the electrode-holder guide pin 211 is energized up, the magazine electrode holder 210 will go up even to a magazine open position (the highest location), the location of the magazine shift plate 240 at this time will be detected by the magazine opening switch 14, and the magazine shift motor 221 will stop.

[0239] ** division of a magazine -- by rise of the above magazine electrode holders 210, like drawing 36, although the magazine top-face section 120 grasped by bottom grasping pawl 210b is raised with the tray 110 of three sheets, since the magazine inferior-surface-of-tongue section 130 is grasped by bottom grasping pawl 2a of the chassis unit 1, it remains caudad with the tray 110 of two sheets.

Therefore, the magazine case 100 will be divided up and down in the interior of the chassis unit 1. Moreover, since the disk D by the side of the magazine top-face section 120 is held by the projections 117a and 119 for disk maintenance of a tray 110, it goes up with a tray 110, without falling.

[0240] 2-2-5. A drive motor 361 rotates the large cam gear 372 further clockwise after the completion of division of the rotation magazine case 100 of a swing unit transfer actuation ** swing chassis. Then, since the gearing part of gear 372a for a transfer drive gears to transfer rotation gear 425b, as shown in drawing 59, the swing chassis 420 transfers and counterclockwise rotation is started centering on

rotation shaft 425a.

[0241] If the swing chassis 420 continues rotation, the swing unit 400 whole will be transferred between the magazine top-face sections 120 and the magazine inferior-surface-of-tongue sections 130 which were divided. And if a turntable 520 arrives at the pin center, large of Disk D, the edge of the swing chassis 420 will stop in contact with the specification part which was prepared in the up-and-down chassis 350 and which is not illustrated. If completion of such transfer of the swing chassis 420 is detected by the brush switch 364, a drive motor 361 will stop.

[0242] 2-2-6. The drive unit 500 on the disk chucking actuation swing unit 400 transferred as mentioned above is in a floating lock condition, and the turntable 520 of a drive unit 500 is in the location corresponding to the main hole of Disk D. If the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped to a disk chucking location (mid-position) in this condition, the location of the magazine shift plate 240 at this time will be detected by the chucking switch 13, and the magazine shift motor 221 will stop.

[0243] Thus, if the magazine electrode holder 210 descends to the mid-position, the magazine top-face section 120 held at this will also descend. Then, since the disk D held at the 3rd step of tray 110 in the magazine top-face section 120 is pushed against a turntable 520, the disk insertion section 524 inserts in the main hole of Disk D and mooring section 525a of the disk hook 525 engages with the upper limit of the main hole of Disk D, Disk D is held on a turntable 520.

[0244] 2-2-7. A drive motor 361 rotates the large cam gear 372 further clockwise after rotation disk chucking completion of a disk release actuation ** tray. Then, since the gearing part of gear 372c for a tray drive gears with the middle gear 373 and the middle gear 373 rotates counterclockwise, the tray gear 374 is rotated clockwise. For this reason, the tray 110 of three sheets on which gear slot 116a is engaging with the tray gear 366 rotates counterclockwise further.

[0245] ** As shown in drawing 57 (C) at the time of ***** of a disk, since suppressed area 119a separates from the press side 127 established in the magazine top-face section 120 while separating from the projection 117 for tray support from 123d of ridges in slit 123a, the projections 117a and 119 for disk maintenance return outside, and cancel maintenance of Disk D.

[0246] 2-2-8. magazine evacuation actuation -- if the magazine shift motor 221 is started and the magazine electrode holder 210 is raised to a magazine open position (the highest location) after the perimeter of Disk D is released as mentioned above, the location of the magazine shift plate 240 at this time will be detected by the magazine opening switch 14, and the magazine shift motor 221 will stop.

[0247] Thus, if the magazine electrode holder 210 goes up to the highest location again, the magazine top-face section 120 held at this will also go up. Therefore, it leaves the disk D of one sheet by which chucking was carried out on the turntable 520, the tray 110 of three sheets in the magazine top-face section 120 is lifted, and path clearance required for playback of Disk D is secured.

[0248] 2-2-9. Since gear 372d for a floating lock drive will gear with the floating lock gear 556 if the large cam gear 372 rotates further clockwise after completing floating lock discharge actuation magazine evacuation actuation, the floating lock gear 556 rotates counterclockwise. Then, since a part of floating lock gear 556 is connected with the left end section of the 1st lock plate 552 rotatable as shown in drawing 60, the 1st lock plate 552 carries out slide migration in the drawing Nakaya mark direction.

[0249] And since actuation of the 1st lock plate 552 is transmitted to the 2nd lock plate 553 as a motion of hard flow through the reverse link 554, the 2nd lock plate 553 carries out slide migration to the 1st lock plate 552 and hard flow. For this reason, the lock holes 552a and 553a in the 1st and 2nd lock plates 552, 553 release cone projection 511a of the drive base 510.

[0250] Furthermore, since actuation of the 2nd lock plate 552 is transmitted to damper arm gear 515a through the damper rotation gear 516, the damper arm 515 rotates counterclockwise. Then, from the inside of the successive range of the optical pickup 530 (stowed position), the movable absorber 514 evacuates to the outside (playback location) of the drive base 520, and supports the drive base 520 in this condition. Therefore, the drive base 520 will be in floating supported only by two fixed absorbers 513 and one movable absorber 514.

[0251] 2-2-10. As mentioned above, play the disk D on the disk playback actuation turntable 520 after

making the drive base 510 into floating. Since the drive base 510 is in floating, the vibration from the outside is absorbed by the absorber 511, the member of a turntable 520 and optical pickup 530 grade is not influenced by vibration, but the exact read of it becomes possible.

[0252] 2-2-11. Explain the activity which contains again the disk D which ended disk re-receipt actuation playback on the tray 110 in the magazine case 100.

[0253] ** If a drive motor 361 is started and the large cam gear 372 is counterclockwise rotated after suspending rotation of the floating relock actuation turntable 520, the floating lock gear 556 will rotate clockwise. Then, since the 2nd lock plate 553 carries out slide migration at the method of the right while the 1st lock plate 552 carries out slide migration at a left, the lock holes 552a and 553a engage with cone projection 511a of the drive base 510.

[0254] Furthermore, since actuation of the 2nd lock plate 552 is transmitted to damper arm gear 515a through the damper rotation gear 516 and the damper arm 515 rotates clockwise, the movable damper 514 returns in the successive range (stowed position) of the optical pickup 530 from the outside (playback location) of the drive base 520.

[0255] ** If the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped to a disk chucking location (mid-position) where it carried out the floating lock of the disk re-grasping actuation drive base 510 and a variation rate is regulated, the location of the magazine shift plate 240 at this time will be detected by the chucking switch 13, and the magazine shift motor 221 will stop. Thus, if the magazine electrode holder 210 descends to the mid-position again, the 3rd step of tray 110 of ** in the magazine top-face section 120 will approach the disk D on a turntable 520.

[0256] And if the large cam gear 372 is succeedingly rotated counterclockwise with a drive motor 361, since the gearing part of gear 372c for a tray drive will gear with the middle gear 373 and the middle gear 373 will rotate clockwise, the tray gear 374 is rotated counterclockwise. For this reason, the tray 110 of three sheets on which gear slot 116a is engaging with the tray gear 366 rotates clockwise.

[0257] Since suppressed area 119a is pressed by the press side 127 established in the magazine top-face section 120 while the projection 117 for tray support is pressed by 123d of ridges in slit 123a at this time, the projections 117a and 119 for disk maintenance project inside, and hold Disk D.

[0258] ** If the magazine shift motor 221 is started and the magazine electrode holder 210 is raised to a magazine open position (the highest location) in the condition of the disk chucking discharge actuation above, the location of the magazine shift plate 240 at this time will be detected by the magazine opening switch 14, and the magazine shift motor 221 will stop.

[0259] Thus, if the magazine electrode holder 210 goes up to the highest location, the magazine top-face section 120 held at this will also go up. Therefore, the main hole escapes from the disk insertion section 524, and the disk D held by the 3rd step of projections 117a and 119 for disk maintenance of a tray 110 goes up with the magazine top-face section 120.

[0260] ** swing unit start actuation -- rotate the large cam gear 372 counterclockwise with a drive motor 361 after canceling chucking Of Disk D as mentioned above. Then, since the gearing part of gear 372a for a transfer drive gears to transfer rotation gear 425b, the swing chassis 420 transfers and clockwise rotation is started centering on rotation shaft 425a.

[0261] If the swing chassis 420 continues rotation, the swing unit 400 whole will be shaken out from between the magazine top-face sections 120 and the magazine inferior-surface-of-tongue sections 130 which were divided, and will return to the initial valve position of the method of the left rear of the chassis unit 1.

[0262] ** magazine coalesce actuation -- if the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped even to a magazine insertion discharge location (the minimum location) after the swing unit 400 is shaken out as mentioned above, the location of the magazine shift plate 240 at this time will be detected by the magazine closing switch 12, and the magazine shift motor 221 will stop.

[0263] Thus, the magazine top-face section 120 grasped by the descending magazine electrode holder 210 descends with the tray 110 of three sheets, and coalesces in the magazine inferior-surface-of-tongue section 130 which remained caudad with the tray of two sheets.

[0264] ** Rotate magazine lock actuation, next the large cam gear 372 counterclockwise. Then, since the gearing part of the gear 372 for a tray drive gears with the middle gear 373 and the middle gear 373 rotates clockwise, the tray gear 366 is rotated counterclockwise. For this reason, the tray 110 of three sheets on which gear slot 116a is engaging with the tray gear 366 rotates further clockwise.

[0265] Thus, if a tray 110 rotates, the projection 117,118 for tray support around each tray 110 will go into slit 132a by the side of the bottom slit section 132. At this time, only the projection 117,118 for tray support of the maximum upper case was located ranging over the boundary of the top slit section 123 and the bottom slit section 132, and the projection 117,118 for tray support of that lower berth is completely contained in the bottom slit section 132 side. Therefore, the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 will be in the lock condition which cannot be divided up and down.

[0266] 2-2-12. up-and-down chassis downward actuation -- as mentioned above, start the loading motor 311 and rotate shift cam gear 312 ** clockwise, after completing coalesce and the lock of the magazine case 100. then, the middle -- the gearing section of gear 312b engages with the rack 321 for an up-and-down shift of the post-shift plate 320. Then, since the post-shift plate 320 carries out slide migration rightward, the up-and-down guide pin 351 of the up-and-down chassis 350 is caudad energized by the posterior part stair-like cam 322.

[0267] Since the link plate 330 energized with the post-shift plate 320 by coincidence rotates and the left shift plate 340 carries out slide migration in back, the up-and-down guide pin 351 of the left part of the up-and-down chassis 350 is caudad energized by the left part stair-like cam 341 of the left shift plate 340.

[0268] As mentioned above, since the up-and-down guide pin 351 is energized caudad, the up-and-down chassis 350 descends and it returns to the early minimum location. and the middle of the shift cam gear 312 -- since the toothless part faces the rack 321 for an up-and-down shift, the post-shift plate 320 stops gear 312b.

[0269] 2-2-14. If rotation of the clockwise rotation of the shift cam gear 312 is continued to a magazine ejection actuation pan, since lower-berth gear 312c will engage with it at rack 650a for loading of the rack plate 650, the rack plate 650 carries out slide migration leftward. Then, since notch 650a of the rack plate 650 energizes protruding object 660a of the catch arm 660 leftward, the catch arm 660 rotates counterclockwise and moves the extrusion member 630 ahead.

[0270] Since the catch section 631 of the knockout member 630 is engaging with hollow 131a of the magazine inferior-surface-of-tongue section 130, the magazine case 100 is extruded with advance of the extrusion member 630. When specified quantity discharge of the magazine case 100 is carried out from the magazine insertion opening 2, with ejection and a switch 11, the loading motor 311 stops and a loading arm 620 remains in the completion location of discharge. In this condition, a user pulls [a user] out the magazine case 100 from the magazine insertion opening 2.

[0271] 2-3. the effectiveness of the gestalt of the 2nd operation -- the effectiveness of the gestalt of these above operations is as follows. That is, since disk maintenance can be performed by forming 123d of ridges in the top slit section 123, without preparing a member like the planet gear 112 in the gestalt of the 1st operation, the lock of the magazine case 100, disk selection, maintenance of a tray 110, disk release, and disk maintenance are realizable with a still simpler configuration. Moreover, since the movable damper 514 is in a stowed position when the SUINGUYU chassis 420 is not transferred, necessary area can be saved and the whole equipment can be contraction-ized. And at the time of swing unit transfer, since the movable damper 514 comes to an evacuation location, the distance between each damper is secured enough and does not spoil an oscillating reduction function.

[0272] Moreover, since rotation of the movable absorber 514 makes it synchronize with the floating lock device 550, when absorber support is required, it can be limited, and can move the movable absorber 514 to an evacuation location.

[0273] [3. The gestalt of the 3rd operation implementation of the 3rd of gestalt] this invention is explained below with reference to drawing 61 .

[0274] 3-1. The disk magazine of the gestalt of configuration book operation is the almost same

configuration as the disk magazine of the gestalt of the 1st operation of the above. However, as shown in drawing 61, 1st notch 121a is formed in the center of a posterior part of the top-face plate 121 of the magazine top-face section 120. Moreover, ahead [of the top-face plate 121 / left brink], 2nd notch 121b is formed.

[0275] 3-2. the operation effectiveness -- as for the disk D completely held in the magazine case 100, according to the gestalt of these above operations, the periphery is mostly covered with the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130. Therefore, the disk D exposed at the time of inserting and discharging a magazine to a disk unit and the time of carrying must have been damaged.

[0276] And if the disk discharge lever 125 shown in drawing 28 is rotated and Disk D is discharged a little, a part of periphery of Disk D will be exposed in the 1st notch 121a and 2nd notch 121b which were formed in the magazine top-face section 120. Therefore, by holding the edge of this exposed disk D, it can take out easily, without touching a signal side, and adhesion of the fingerprint at the time of being ejection can be prevented. Furthermore, since the 1st notch 121a and 2nd notch 121b are only formed, a manufacturing cost can also be saved.

[0277] [4. Gestalt] this invention of other operations is not limited to the gestalt of the above operations, and the number of each part material, a configuration, magnitude, etc. can change it suitably. For example, as long as the number of the trays 110 in the magazine case 100 is plurality, it may be how many sheets. Therefore, according to this, the number of slits 123a, 132a, and 212 can also be changed. In addition, in the gestalt of the above-mentioned operation, although the example of operation at the time of choosing the disk D of the tray 110 of the 3rd sheet was explained, the tray 110 of other stages can also be similarly chosen by rise and fall of the up-and-down unit 300.

[0278] Moreover, the notch in the gestalt of the 3rd operation of the above can also be prepared [also preparing in either the top-face plate 121 of the magazine top-face section 120, and the inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130, and] for both sides. Moreover, the number of notches may not be limited to two, either, but one or three or more are sufficient as it, and the configuration is also free.

[0279] Moreover, although the gestalt of the above-mentioned operation was the configuration of dividing the magazine case 100 by making it going up and down the magazine top-face section 120, it is also possible by constituting the gestalt of the above-mentioned operation to vertical hard flow, and making it go up and down the magazine inferior surface of tongue 120 to consider as the configuration which divides the magazine case 100, is made to carry out chucking of the disk D to the turntable 520 which turned to the lower part, and performs disk playback.

[0280] Furthermore, the record medium used for this invention is not limited to CD etc. that what is necessary is just a disk-like thing. Moreover, this invention can also be constituted only as equipment for playback as equipment in which record and playback are possible.

[0281]

[Effect of the Invention] According to this invention, the gap at the time of dividing a disk magazine up and down and coalescing according to a simple device, can be prevented, and the disk unit which can realize good actuation can be offered as explained above.

[0282] Moreover, according to this invention, the small disk unit which can prepare the transfer structure of the disk playback section and the rise-and-fall structure of a magazine electrode holder in a narrow tooth space can be offered.

[0283] Moreover, according to this invention, the small disk unit which can save the area for absorbers can be offered, without spoiling an oscillating reduction function.

[0284] Moreover, according to this invention, the swing unit in which the disk playback section was prepared can be held more firmly, and a disk unit strong against vibration can be offered at the time of disk playback.

[0285] Moreover, according to this invention, while preventing the dirt of the signal side in the case of receipts and payments of a disk, the disk magazine which can prevent damage on the disk at the time of detaching and attaching to a disk unit can be offered.

[Translation done.]

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TECHNICAL FIELD

[Field of the Invention] By choosing a desired disk, starting playback and the disk unit to record out of the disk magazine which held two or more disks, and performing disk selection, playback, and record, where a disk magazine is divided especially up and down, this invention enables contiguity arrangement of each configuration member, and relates to the disk magazine used for the disk unit and this aiming at the miniaturization of the whole equipment.

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PRIOR ART

[Description of the Prior Art] In recent years, the spread of the disk units using a disk as a medium is remarkable like a CD player or MD player. Especially, as a disk unit for mount, the thing of the autochanger type which chooses a desired disk and is reproduced out of the disk magazine which contained two or more disks is developed. Since the disk unit of this autochanger type does not need to take one disk at a time in and out whenever it exchanges the disk to play, it is convenient especially as an object for mount.

[0003] The disk unit using such a disk magazine adjoins the magazine hold section, and the disk playback section is arranged. And after pulling out the disk of the request in a magazine and conveying and setting to the disk playback section according to a conveyance device, there was much what performs disk playback. However, if it is made this configuration, in order to secure the tooth space which sets a disk to the disk playback section and is reproduced, it is necessary to keep a fixed distance between the disk playback sections and the magazine hold sections which were prepared adjacently. Therefore, as a device for mount by which the whole disk unit will large-sized-ize, and the installation tooth space was restrained, it was disadvantageous.

[0004] For example, if it sees for the latest audio equipment for mount, the opening dimension by the side of the car which contains it will have been unified into 180x50 (mm) called DIN size or 180x100 (mm) called double DIN size. Moreover, that which gets mixed up 160mm and suits also about the depth dimension of opening is the present condition, and receives constraint of the audio equipment anchoring tooth space of a car.

[0005] On the other hand, since considering that the size of a compact disk is the diameter of 120mm the dimension more than 2= 120x240 (mm) is needed in the longest direction of breadth by the above disk units, it turns out that a device cannot be contained at opening located beside a driver's seat.

[0006] He is trying to contain the inside of the trunk of a car, and near the step of a driver's seat in the conventional CD autochanger from the above situations. However, in the case of the former, there is a fault, like the long line which will not become if open a trunk whenever it is the exchange of a disk to which a trunk tooth space becomes narrow, and it kicks and which connects a trunk and a control unit is needed. Moreover, in the case of the latter, a space part underfoot becomes so narrow, and when a guide peg touches accidentally, it may damage.

[0007] In order to cope with this, a disk magazine is divided up and down and the disk unit which performs disk playback where the disk playback section is transferred between them is proposed as proposed by JP,6-203519,A. Since a disk stowed position and a disk playback location lap, such a disk unit can reduce a horizontal tooth space.

[0008] In addition, usually performs division of a disk magazine with the magazine electrode holder prepared in the chassis unit possible [rise and fall]. That is, the configuration of raising a magazine electrode holder with the pin which moves in the inside of a stair-like cam is taken by inserting the pin fixed to the magazine electrode holder in the stair-like cam formed in the cam plate, and carrying out slide migration of this cam plate in order. And by holding a upside disk magazine and raising this magazine electrode holder with a magazine electrode holder, a upside disk magazine is lifted with an

internal tray, and it divides from a lower disk magazine.

[Translation done.]

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EFFECT OF THE INVENTION

[Effect of the Invention] According to this invention, the gap at the time of dividing a disk magazine up and down and coalescing according to a simple device, can be prevented, and the disk unit which can realize good actuation can be offered as explained above.

[0282] Moreover, according to this invention, the small disk unit which can prepare the transfer structure of the disk playback section and the rise-and-fall structure of a magazine electrode holder in a narrow tooth space can be offered.

[0283] Moreover, according to this invention, the small disk unit which can save the area for absorbers can be offered, without spoiling an oscillating reduction function.

[0284] Moreover, according to this invention, the swing unit in which the disk playback section was prepared can be held more firmly, and a disk unit strong against vibration can be offered at the time of disk playback.

[0285] Moreover, according to this invention, while preventing the dirt of the signal side in the case of receipts and payments of a disk, the disk magazine which can prevent damage on the disk at the time of detaching and attaching to a disk unit can be offered.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, there were the following points which should be improved in the disk unit using the disk magazine of the above block construction. That is, if a gap arises in the location of an up-and-down disk magazine in case the divided disk magazine is made to coalesce again, a malfunction will be produced, without the ability coalescing. If a firm maintenance device tends to be used or it is going to raise location precision in order to cope with this, a complicated mechanism and expensive components will be needed and it will become disadvantageous for a miniaturization and low-cost-izing.

[0010] Moreover, in order to go up and down the magazine electrode holder by the cam plate smoothly as mentioned above, it is necessary to prepare a cam plate in right and left of a magazine electrode holder, or two locations which are called order and which counter. However, to make it the configuration which transfers the disk playback section between the divided disk magazines, it is necessary to make the disk playback section for transfer stand by for one of right and left. For this reason, in small equipment which goes into DIN size, the cam plate arranged in the standby side of the disk playback section cannot secure the stroke of a cross direction easily. Moreover, since it is necessary to release the front of a magazine electrode holder, i.e., a near side, as magazine insertion opening, it is not realistic. [of preparing a cam plate before and after a magazine electrode holder]

[0011] Moreover, in the disk unit for mount, in order to reduce the vibration from the outside, the vibrationproofing device which used the damper etc. for the disk playback section is established. However, the optical pickup which moves in the direction of a path of a disk is surely prepared in the disk playback section. For this reason, if a damper is not formed outside that successive range as it does not serve as hindrance of migration of optical pickup, there is. [no] Therefore, the area for absorbers is needed for an excess at the disk playback section, and it leads to enlargement of the whole disk unit.

[0012] Moreover, the disk playback section is usually prepared on the swing unit which rotates centering on a revolving shaft. For this reason, when transferred between the up-and-down disk magazines with which the swing unit was divided, the disk playback section will be supported only by one point of the rotation supporting point of a swing unit, and becomes weak to vibration. Therefore, it becomes disadvantageous when using as a disk unit for mount.

[0013] Moreover, since a fingerprint will attach a disk signal side and it will cause poor playback if it is touched by the direct hand, in case a disk is taken in and out of a disk magazine, it fully needs to be careful. And the disk magazine has the structure of taking a disk in and out between the trays which are the shelves with which the interior is divided multistory. Therefore, when putting a disk into a disk magazine, it can put in by having the periphery of a disk, and pushing and putting in the back end after inserting in a disk magazine, without touching a signal side. However, since the disk needed to be gathered and removed in the place to which the disk was extruded and the disk came out of the disk magazine a little when removing a disk from a disk magazine, the fingerprint may have been left on the signal side.

[0014] In order to cope with this, making the appearance of a disk magazine small and considering as the configuration in which a disk is exposed to some extent beforehand is also considered. If it is made

this configuration, the amount of protrusions of the disk in the case of ejection can be enlarged, and it can take out easily by holding the edge of a disk, without touching a signal side. However, the exposed part of a disk may be damaged in the time of inserting and discharging a disk magazine to a disk unit in this case, and the case of carrying.

[0015] This invention is to be proposed in order to solve the trouble of the above conventional techniques, and for the purpose to prevent the gap at the time of dividing a disk magazine up and down and coalescing according to a simple device, and offer the disk unit which can realize good actuation. Moreover, the 2nd purpose of this invention is to offer the small disk unit which can prepare the transfer structure of the disk playback section, and the rise-and-fall structure of a magazine electrode holder in a narrow tooth space. Moreover, the 3rd purpose of this invention is to offer the small disk unit which can save the area for absorbers, without spoiling an oscillating reduction function. Moreover, the 4th purpose of this invention can hold more firmly the swing unit in which the disk playback section was prepared, and is to offer a disk unit strong against the vibration at the time of disk playback. Moreover, the 5th purpose of this invention is to offer the disk magazine which can prevent damage on the disk at the time of detaching and attaching to a disk unit while preventing the dirt of the signal side in the case of receipts and payments of a disk.

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MEANS

[Means for Solving the Problem] In order to solve the above troubles, the disk unit of this invention The tray equipped with a disk of two or more sheets is contained. The disk magazine which can be divided into the top-face section and the inferior-surface-of-tongue section, The chassis unit equipped with said disk magazine, and the magazine division section which makes said disk magazine with which said chassis unit was equipped divide and coalesce, The disk selection section which chooses a desired disk, and the swing unit transferred between the divided up-and-down disk magazines, It is prepared on said swing unit and has the following technical features in the disk unit which has the disk playback section which plays the disk chosen by said disk selection section.

[0017] That is, a vertical guide hole is formed in either [at least] the top-face section of said disk magazine, or the inferior-surface-of-tongue section, and invention according to claim 1 is characterized by preparing the guide shaft of the perpendicularly it inserts in said guide hole at the time of division of said disk magazine and coalesce in said chassis unit. In the above invention according to claim 1, in case the magazine division section divides a disk magazine, the top-face section or the inferior-surface-of-tongue section of a disk magazine moves perpendicularly. A guide shaft inserts in the guide hole formed in the top-face section or the inferior-surface-of-tongue section which moves at this time. And in case a disk magazine is coalesced, since migration of the magazine top-face section or the inferior-surface-of-tongue section is guided by the guide shaft inserted in the guide hole, a location gap is prevented and a malfunction does not arise by it.

[0018] Invention according to claim 2 said magazine division section The magazine electrode holder which grasped the top-face section or the inferior-surface-of-tongue section of said disk magazine, and was prepared in said chassis unit possible [rise and fall], It has the cylindrical cam prepared in said chassis unit rotatable, and the driving source which rotates said cylindrical cam. An electrode-holder guide pin is prepared in the end of said magazine electrode holder, a spiral cam is formed in the lateral surface of said cylindrical cam, and it is characterized by inserting said electrode-holder guide pin in said spiral cam. In the above invention according to claim 2, by the cylindrical cam to which the depth (before or after) direction and the width-of-face (right and left) direction do not take a comparison-tooth space, since a magazine electrode holder is moved up and down, space-efficient member arrangement is attained and the miniaturization of the whole equipment becomes easy.

[0019] Invention according to claim 3 is set to a disk unit according to claim 2. Said magazine division section said chassis unit -- order -- a slide -- with the magazine shift plate prepared movable It has the transfer device in which the driving force of said driving source is transmitted to said magazine shift plate. Said cylindrical cam and said magazine shift plate Insert said magazine electrode holder in between, and it is arranged in the opposite side the transfer side of said disk playback section. To said said cylindrical-cam [in said magazine electrode holder], and magazine shift plate side An electrode-holder guide pin is prepared, respectively and an inclination cam die is prepared in said magazine shift plate. One electrode-holder guide pin of said magazine electrode holder It is characterized by being inserted in the spiral cam of said cylindrical cam, and inserting the electrode-holder guide pin of another side in the inclination cam die of said magazine shift plate. Although a depth tooth space becomes short

in the above invention according to claim 3 in the transfer side of the disk playback section in a magazine electrode holder, since the depth stroke with a long cylindrical cam is unnecessary, trouble does not have it in rise and fall of a magazine electrode holder. Moreover, since the transfer side of the disk playback section and the opposite side tend to secure a depth tooth space, although they need a depth stroke, they can shorten the cross direction of equipment by using the magazine shift plate which does not need to take width of face. Therefore, transfer structure of the disk playback section and rise-and-fall structure of a magazine electrode holder can be realized to a narrow tooth space, and the whole disk unit can be miniaturized to it.

[0020] Said disk playback section is supported for invention according to claim 4 through two or more absorbers on said swing unit, and at least one of said two or more absorbers is characterized by being the movable absorber which was able to prepare between the stowed position in the movable range of said disk playback section, and the evacuation locations from which it separates from the movable range of said disk playback section movable. In the above invention according to claim 4, after swing unit transfer can save necessary area by containing a movable absorber to a stowed position at the time of swing unit standby, without spoiling the oscillating reduction function by the absorber by removing a movable absorber from the movable range of the disk playback section, and performing disk playback.

[0021] Invention according to claim 5 is set to a disk unit according to claim 4. Before transfer of said swing unit It considers as the floating lock condition which regulates the variation rate of said disk playback section. After transfer of said swing unit The floating lock device which makes said disk playback section floating by support of only said absorber is established. When said disk playback section is in a floating lock condition When said movable absorber is in a stowed position and said disk playback section is in a floating lock condition, it is characterized by establishing the gear device in which said floating lock device and said movable absorber are synchronized so that said movable absorber may come to an evacuation location. In the above invention according to claim 5, since migration of a movable absorber can be synchronized with a floating lock device, it can limit, when absorber support is required, and a movable absorber can be moved to an evacuation location.

[0022] Invention according to claim 6 is characterized by preparing the attaching part holding the tip of said transferred swing unit in said chassis unit. In the above invention according to claim 6, at the time of the disk playback by the disk playback section, since the tip of a swing unit is held by the attaching part, it becomes the rotation supporting point and two-point support with an attaching part, and becomes strong to vibration.

[0023] In a disk unit according to claim 6, invention according to claim 7 is characterized by preparing the hold arm holding the edge of the opposite side with said swing unit tip held at said attaching part, when said swing unit is transferred. In the above invention according to claim 7, since the opposite end is held by the hold arm at the time of the disk playback by the disk playback section while the tip of a swing unit is held by the attaching part, it becomes three-point support of the rotation supporting point, an attaching part, and a hold arm, and becomes stronger to vibration.

[0024] In a disk unit according to claim 7, invention according to claim 8 is characterized by preparing the hold plate which presses said hold arm in the swing unit maintenance direction, when said swing unit is transferred. In the above invention according to claim 8, since a hold plate presses a hold arm at the time of the disk playback by the disk playback section while three swing units are supported by the rotation supporting point, an attaching part, and the hold arm, it is held still more firmly.

[0025] Moreover, the tray of two or more sheets is prepared multistory in the case which consists of a top-face plate, an inferior-surface-of-tongue plate, and a side-face plate, and the disk magazine of this invention has the following technical features from the opening side face in said case in the disk magazine which can hold a disk between said trays.

[0026] That is, invention according to claim 9 is characterized by forming the notch in the opening side-face side at least at one side by the side of said top-face plate and said inferior surface of tongue. Since the disk held in the disk magazine is mostly covered with a magazine top-face plate and a magazine inferior-surface-of-tongue plate in the above invention according to claim 9, in case a disk magazine is detached and attached to a disk unit, there is no possibility of damaging a disk. Moreover, if it extrudes a

little in order to remove a disk, a disk periphery will be exposed in a notch. Therefore, it can pull out easily by holding and taking out the exposed disk edge, without touching the signal side with a disk. [0027] a disk discharge lever is prepared rotatable in an opening side face and the opposite side, and it becomes possible for the end of said disk discharge lever to press a disk -- as -- the edge of a disk -- contacting -- the other end of said disk discharge lever -- the rotation from the outside -- it is characterized by having exposed so that it may become operational. [in / on a disk magazine according to claim 9 and / in invention according to claim 10 / said case] In the above invention according to claim 10, by operating and rotating a disk discharge lever from the outside, a disk can be extruded easily, the disk edge exposed in the notch can be held, and it can pull out easily.

[0028]

[Embodiment of the Invention] [1. The gestalt of the 1st operation implementation of the 1st of gestalt] this invention is explained below with reference to drawing 1 - drawing 42 .

[0029] 1-1. The disk unit of the gestalt of whole configuration 1-1-1. configuration book operation of the gestalt of the 1st operation is constituted by preparing two or more following units on the chassis unit 1 equipped with the case 100 of a disk magazine, as shown in drawing 1 and drawing 2 .

[0030] ** The magazine ejection unit 600 (refer to drawing 13) which divides the magazine case 100 up and down, is prepared on the up-and-down unit 300** up-and-down unit 300 which chooses the disk D of the magazine shift unit 200** purpose which secures a playback tooth space in the meantime, and discharges the drive unit 500** magazine case 100 which was prepared on the swing unit 400** swing unit 400 transferred to the playback tooth space of the divided magazine case 100, and was equipped with optical pickup

Hereafter, these configurations are explained in full detail.

[0031] 1-1-2. Explain the configuration of disk magazine **** and a disk magazine with reference to drawing 3 -6. In addition, the bold arrow in drawing 3 - 6 is the path of insertion of the magazine case 100 to the chassis unit 1. That is, as shown in drawing 3 , it is divided on the tray 110 of five sheets which the interior holds Disk D according to an individual, and holds the magazine case 100 of a thin form. This magazine case 100 is formed in the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 possible [division]. The configuration of each part is as follows.

[0032] ** Each tray 110 which divides the inside of the tray magazine case 100 is the member of light-gage discoid, as shown in drawing 4 . Two tray support pawls 111 projected outside are formed in two places (edge under drawing Nakagami) to which that periphery counters this tray 110. Inside two tray support pawls 111 in the inferior surface of tongue of a tray 110, the planet gear 112 is attached rotatable, respectively. Disk support pawl 112a which supports the inferior surface of tongue of the disk D with which the tray 110 was equipped is prepared in these two planet gears 112.

[0033] The lobe 116 projected outside is formed in the edge of the magazine path of insertion (the direction of an arrow head of drawing 4) in a tray 110. Gear slot 116a is formed in the edge of this lobe 116. And the wave-like 1st slot 114 is formed between the lobe 116 and the tray support pawl 111 of the near. Moreover, the wave-like 2nd slot 115 is formed near this and the tray support pawl 111 of the side which counters.

[0034] Furthermore, the specification part 113 of the shape of radii which the periphery of Disk D contacts is formed in the semicircle part on the left-hand side of drawing 4 in a tray 110. And another tray support pawl 111 is formed near the pars intermedia of this semicircle part.

[0035] ** Explain the configuration of the magazine top-face section magazine top-face section 120 with reference to drawing 5 . In addition, drawing 5 is the perspective view which looked up at the magazine top-face section 120 from the background. That is, the magazine top-face section 120 is constituted by the top-face plate 121 and the side-face plate 122. The top-face plate 121 is a plate which formed abbreviation square-like one corner in the shape of radii. The side-face plate 122 is a plate of a cross-section L typeface, and is formed in three corners except a radii-like corner. Inside these three side-face plates 122, side-attachment-wall 122a of the shape of a curved surface which the perimeter of a tray 110 contacts is formed.

[0036] And the top slit section 123 which supports a tray 110 to the magazine top-face section 120 side

is formed in the location corresponding to three corners at the top-face plate 121. Slit 123a in which three tray support pawls 111 of each tray 110 are inserted, respectively is formed in the besides side slit section 123. The number of slit 123a is the number of sheets and the same number (the gestalt of this operation five) of a tray 110.

[0037] The maximum upper case is formed for a long time among such slit 123a compared with other stages. Furthermore, gear slot 123c to which a planet gear 112 engages with each partition 123b is formed in the two (drawing 5 is located up and down) slit sections 123 which counter. This gear slot 123c is prepared near the edge of the opposite side with the open end in which the tray support pawl 111 is inserted.

[0038] Moreover, the tray hold arm 124 is formed rotatable inside [on the other hand / (lower part of drawing 5)] the side-face plate 122 which counters the top-face plate 121. This tray hold arm 124 is torsion coiled-spring 124a Depended, and is energized in the direction in which that tip engages with the 1st slot 114 of a tray 110.

[0039] And the disk discharge lever 125 for discharging the disk D held between each tray 110 according to an individual with hand control is formed in the corner of the side (left of drawing 5) which counters the corner of the shape of radii in the top-face plate 121. The number of these disk discharge levers 125 is the number of disk hold, and the same number (the gestalt of this operation five). The disk discharge lever 125 is formed rotatable respectively independently, and the tip is energized by extension spring 125a in the direction which separates from Disk D.

[0040] Furthermore, near the tray hold arm 124 in the top-face plate 121, and the disk discharge lever 125, the guide hole 126 in which two guide shafts 3 mentioned later, respectively are inserted is formed.

[0041] ** The magazine inferior-surface-of-tongue section magazine inferior-surface-of-tongue section 130 is constituted by the top-face plate 121 and the inferior-surface-of-tongue plate 131 of the same configuration as shown in drawing 6 . The bottom slit section 132 which holds a tray 110 to the magazine inferior-surface-of-tongue section 130 side, respectively is formed in the location corresponding to the three top slit sections 123 by the side of the magazine top-face section 120 at the inferior-surface-of-tongue plate 131. Same number formation of the slit 132a in which the tray support pawl 111 of each tray 110 is inserted is carried out with the number of sheets of a tray 110 at this bottom slit section 132. Slit 132a of the maximum upper case is short formed among this slit 132a compared with other stages.

[0042] Such five slit 132a of the bottom slit section 132 constitutes five steps of slits which continued horizontally with slit 123a of the top slit section 123, when it is in the condition that the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 coalesced, as shown in drawing 7 .

[0043] Moreover, the disk hold arm 133 is formed in the corner of the magazine path of insertion (the direction of an arrow head of drawing 6) in the magazine inferior-surface-of-tongue section 130 rotatable. In the tray hold arm 124 in the magazine top-face section 120, this disk hold arm 133 is located in the opposite side, and is energized in the direction in which that tip engages with the 2nd slot 115 of a tray 110 by torsion coiled spring 133a. Furthermore, rectangle-like hollow 131a is formed in the location which visited the magazine path of insertion in the outsole side of the inferior-surface-of-tongue plate 131.

[0044] 1-1-3. a magazine shift unit -- raise the magazine top-face section 120 of the above configurations, and explain the configuration of the magazine shift unit 200 which divides the magazine case 100 according to drawing 8 - drawing 12 . In addition, let the upper part of drawing 8 into back, and let a lower part be the front. This magazine shift unit 200 is constituted by the magazine electrode holder 210, the cylindrical cam 220, the synchro gear 230, and the magazine shift plate 240 grade. The configuration of each part is as follows.

[0045] ** It is the member crooked in cross-section horseshoe-shaped in the plate, and the top face is formed in the almost same configuration as the magazine top-face section 121 so that the magazine electrode-holder magazine electrode holder 210 may cover the top-face plate 121 and both its side of the magazine top-face section 120, as shown in drawing 8 and drawing 11 . this magazine electrode holder

210 -- the inside of the chassis unit 1 -- up and down -- a slide -- it is prepared movable.

[0046] The frame-like magazine insertion opening 2 is formed in the anterior part of the chassis unit 1 so that the front end of the magazine electrode holder 210 may be surrounded. One guide shaft 3 projected perpendicularly is being caudad fixed to the head-lining side of this magazine insertion opening 2 at a time by right and left. And when the magazine electrode holder 210 moves up and down, two insertion hole 210a which the two above-mentioned guide shafts 3 insert in by non-contact, respectively is formed in the top face of the magazine electrode holder 210. Moreover, inside the side face of right and left of the magazine electrode holder 210, bottom grasping pawl 210b which grasps the inserted top-face plate 121 of the magazine top-face section 120 is prepared.

[0047] On the other hand, bottom grasping pawl 2a which grasps the inserted inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130 is prepared in the medial surface of right and left of the magazine insertion opening 2 in the chassis unit 1. In addition, return section 210c opened outside and 2b are formed in the front end of the magazine electrode holder 210 with which the magazine case 100 is inserted, and the front end of the base of the magazine insertion opening 2.

[0048] And as shown in drawing 12 and drawing 8, two are prepared in the right lateral of the magazine electrode holder 210, and one electrode-holder guide pin 211 is formed in the left lateral. right-hand side electrode-holder guide slot 1a by which two right-hand side electrode-holder guide pins 211 were formed in the chassis unit 1 -- a slide -- it is inserted in movable. Two trains of this right-hand side electrode-holder guide slot 1a are formed perpendicularly at the right lateral of the chassis unit 1. left-hand side electrode-holder guide slot 2c by which one left-hand side electrode-holder guide pin 211 was formed in the magazine insertion opening 2 -- a slide -- it is inserted in movable. One train of this left-hand side electrode-holder guide slot 2c is formed perpendicularly at the left lateral of the magazine insertion opening 2.

[0049] Furthermore, as shown in drawing 9 and drawing 11, the tray guide 212 is formed in the posterior part of the magazine electrode holder 210. This tray guide 212 is the member of an inverted-L character form, and screw stop immobilization of the part for that horizontal level is carried out on the top face of the magazine electrode holder 210. Slit 212a corresponding to the number of trays 110 is formed in the perpendicular part of the tray guide 212, and it has at it the composition that the lobe 116 of each tray 110 which rotated to each slit 212a enters.

[0050] ** The cylindrical-cam cylindrical cam 220 is formed in the left side of the magazine insertion opening 2 in the chassis unit 1 rotatable centering on the vertical shaft, as shown in drawing 8 and drawing 9. Spiral cam 220a is formed in the perimeter of a cylindrical cam 220, and the electrode-holder guide pin 211 of the magazine electrode holder 210 is engaging with this spiral cam 220a. Moreover, worm-gear 220b is formed in the perimeter of the lower part of a cylindrical cam 220. This worm-gear 220b constitutes the worm gear by engaging with worm 221a which tells the driving force of the magazine shift motor 221 attached in the chassis unit 1. Furthermore, disc-like gear 220c which is a spur gear is formed in the lowest edge of a cylindrical cam 220.

[0051] ** The synchro gear synchro gear 230 is constituted by the 1st disk section 231 and the 2nd disk section 232 which were prepared in the outsole side of the chassis unit 1 as shown in drawing 8. The 1st disk section 231 and the 2nd disk section 232 adjoin right and left, and are arranged, and the core is established in them rotatable as a shaft, respectively. While circular gear 231a which engages with disc-like gear 220c of a cylindrical cam 220 is formed in the 1st disk section 231, circular gear 231b is formed in the location which counters this circular gear 231a.

[0052] While circular gear 232a which engages with circular gear 231b of the 1st disk section 231 is formed in the 2nd disk section 232, circular gear 232b is formed in the location which counters this circular gear 232a. In addition, the amount of rotation is regulated so that engagement of the circular gears 231b and 232a may not separate from the 1st disk section 231 and the 2nd disk section 232.

[0053] ** it is shown in the right lateral of the magazine SHIFUTOPURETO chassis unit 1 at drawing 8 and drawing 12 -- as -- the magazine shift plate 240 -- order -- a slide -- it is prepared movable. Two inclination cam dies 242 are mutually formed in the vertical plane of this magazine shift plate 240 in parallel. An inclination cam die 242 has the shape of a straight line which inclined from the front,

respectively so that it might become low according to back. and -- this inclination cam die 242 -- the electrode-holder guide pin 211 of the magazine electrode holder 210 -- a slide -- it is inserted in movable.

[0054] Moreover, as the lower limit of the magazine shift plate 240 is shown in drawing 8 , it has the horizontal plane crooked in accordance with the angle of the base of the chassis unit 1, and the rack 241 for a magazine shift is formed in ***** of this horizontal plane. This rack 241 for a magazine shift is engaging with circular gear 232b in the 2nd disk section 232.

[0055] 1-1-4. In order to choose the disk D which carries out up-and-down unit playback, explain the configuration of the up-and-down unit 300 which determines the division location of the magazine case 100 according to drawing 13 - drawing 20 . In addition, let the upper part of drawing 13 into back, and let a lower part be the front. This up-and-down unit 300 is constituted by the loading gear 310, the post-shift plate 320, the link plate 330, the left shift plate 340, the up-and-down chassis 350, and the drive unit 360 grade. The configuration of each part is as follows.

[0056] ** The loading gear loading gear 310 is formed in the back right corner of the base of the chassis unit 1, as shown in drawing 13 . upper case gear 310a which is the intermittent gear whose toothless part is about 3/4 yen as this loading gear 310 is shown in drawing 14 , and the middle where the spur gear was formed in the perimeter -- gear 310b and lower-berth gear 310c which is the intermittent gear whose toothless part is semicircle extent have three-step composition constituted by one. and the driving force of the loading motor 311 attached in the chassis unit 1 -- transfer gear group 311a -- minding -- the middle -- it has composition transmitted to gear 310b.

[0057] ** a back side face [in / as the shift-after back shift plate plate 320 is shown in drawing 13 / the chassis unit 1] -- right and left -- a slide -- it is prepared movable. After this, the lower limit of the shift plate 320 has the horizontal plane crooked in accordance with the angle of the base of the chassis unit 1, and the rack 321 for an up-and-down shift is formed in the first transition of this horizontal plane. This rack 321 for an up-and-down shift is formed in the height which engages with lower-berth gear 310c of the loading gear 310. Furthermore, as shown in the rear view of drawing 15 , the posterior part stair-like cam 322 of two articles which becomes low according to the left (from the left to the right [Seeing from a transverse-plane side.]) is formed in the vertical plane of the post-shift plate 320 from the right.

[0058] ** As the link plate link plate 330 is shown in drawing 13 , it is a sector member and the top-most-vertices section 331 is attached in the outsole side of the chassis unit 1 rotatable. Moreover, the back edge of the radii part of the link plate 330 is connected with the left end section of the horizontal plane in the post-shift plate 320 rotatable.

[0059] ** the left shift plate left shift plate 340 is shown in drawing 13 -- as -- the left side face of the chassis unit 1 -- order -- a slide -- it is prepared movable. This left shift plate 340 has the horizontal plane crooked in accordance with the angle of the base of the chassis unit 1, and the front edge of the radii part of the link plate 330 is connected with the back end of this horizontal plane rotatable. As shown in drawing 16 , the left part stair-like cam 341 of one articles which becomes low according to back is formed in the vertical plane in the left shift plate 340 from the front.

[0060] ** The up-and-down chassis up-and-down chassis 350 is the plate of the horizontal plane of an abbreviation L typeface over the left part from the back side of the chassis unit 1, as shown in drawing 13 . the configurations with this following up-and-down chassis 350 -- the inside of the chassis unit 1 -- up and down -- a slide -- it is prepared movable. That is, as shown in drawing 15 , the vertical plane along the back side face of the chassis unit 1 is formed in the posterior part of the up-and-down chassis 350, and two up-and-down guide pins 351 are formed in this vertical plane. the posterior part stair-like cam 322 of two articles by which these two up-and-down guide pins 351 were formed in the post-shift plate 320 -- respectively -- a slide -- it is inserted in movable.

[0061] Moreover, as shown in drawing 16 , the vertical plane which met the left lateral of the chassis unit 1 is formed in the left part of the up-and-down chassis 350, and one up-and-down guide pin 351 is formed in this vertical plane. the left part stair-like cam 341 of one articles by which this up-and-down guide pin 351 was formed in the left shift plate 340 -- a slide -- it is inserted in movable.

[0062] ** On the above drive unit up-and-down chassis 350, as shown in drawing 17 and drawing 18 ,

the drive unit 360 which rotates a tray 110 is formed. This drive unit 360 is constituted by a drive motor 361, the transfer gear group 362, the mode gear 363, the brush switch 364, the cam gear 365, the tray gear 366, and the tray gear arm 367 grade.

[0063] The transfer gear group 362 consists of two or more gears which transmit the driving force of a drive motor 361 to the mode gear 363. The mode gear 363 is a disc-like spur gear which transmits the driving force from the transfer gear group 362 to the cam gear 365. and it is shown in drawing 19 -- as -- this mode gear 363 -- this and the same axle -- and the brush switch 364 which synchronizes and rotates is formed. Contact v-z of the brush switch 364 is set up so that it can detect which phase has actuation of equipment according to the rotation location of the mode gear 363. The completion of transfer of the swing chassis 420 and y support to release of the disk D of disk support pawl 112a, and, specifically, z supports [the standby condition that the swing chassis 420 is standing by / v /, and w / lock discharge of the magazine case 100 and x] floating lock discharge of the drive base 510.

[0064] As the cam gear 365 is shown in drawing 20, disc-like up gear 365a which is a spur gear, and lower gear 365b which has the two toothless sections and which is an intermittent gear are constituted by one. Up gear 365a is engaging with the mode gear 363. Moreover, ring-like of operation cam-groove 365c is formed in the top face of up gear 365b. This of operation cam-groove 365c has 365d of two U sections which curved to shaft orientations.

[0065] The tray gear 366 is a cylindrical gear of height comparable as the thickness of the magazine case 100, as shown in drawing 17 and drawing 18. This tray gear 366 was formed in the front end of the tray gear arm 367 of L typeface rotatable centering on the vertical shaft, and meshes to up gear 365a of the cam gear 365. The back end of the tray gear arm 367 is prepared in the drive unit 360 rotatable. And tray gear arm rotation pin 367a is attached in the tray gear arm 367 near [the] the back end. This tray gear arm rotation pin 367a is engaging with of operation cam-groove 365c of the cam gear 365.

[0066] 1-1-5. Explain the swing unit 400 transferred between the magazine cases 100 by which swing unit division was carried out according to drawing 21 - drawing 22. Let the upper part of drawing 21 into back, and let a lower part be the front. This swing unit 400 is constituted by the power plate 410, the swing chassis 420, and the hold device 430 grade. The configuration of each part is as follows.

[0067] ** the power plate power plate 410 -- the outsole side of the up-and-down chassis 350 -- right and left -- a slide -- it is prepared movable. The rack 411 for a transfer drive which engages with lower gear 365b of the cam gear 365 is formed in the first transition near the right end of this power plate 410. Moreover, near the center section of the power plate 410, the narrow diameter cylinder-like power roller 412 is being fixed. Furthermore, near the left end section of the power plate 410, the cam 413 for a hold drive of a longitudinal direction is formed. This cam 413 for a hold drive has the level difference which shifts to forward and backward in the middle, bordering on this level difference, left-hand side is become to back horizontal level 413a, and right-hand side has become front horizontal level 413b.

[0068] ** The swing chassis swing chassis 420 is the plate of the shape of an abbreviation triangle established on the up-and-down chassis 350. This swing chassis 420 is formed rotatable focusing on the transfer rotation shaft 421 prepared near [that] the right end section. And the hook-like notch 422 is formed in the right end section of the swing chassis 420. The power roller 412 formed in the power plate 410 is engaging with this hook-like notch 422. Moreover, the projection 423 for a hold is formed in the back side face of the swing chassis 420 near [the] the left end section. Furthermore, the contact pawl 424 is formed in the front end section of the swing chassis 420.

[0069] On the other hand, as shown in drawing 22, when the swing chassis 420 is transferred, the V character slit 6 with which the contact section 424 engages is formed in the right lateral of the chassis unit 1. Corresponding to change of the height of the swing chassis 420, two or more steps of this V character slit 6 are formed.

[0070] ** The hold device hold device 430 is constituted by the hold arm 431, the hold link 432, and the hold plate 433 as shown in drawing 21. The hold arm 431 is the plate of L typeface, and the front end is prepared rotatable near the front end section on the up-and-down chassis 350. Hold hole 431a which engages with the projection 423 for a hold of the transferred swing chassis 420 is formed in the back end of this hold arm 431. Furthermore, the hold arm 431 is energized so that it may rotate clockwise by

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2. **** shows the word which can not be translated.
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MEANS

[Means for Solving the Problem] In order to solve the above troubles, the disk unit of this invention The tray equipped with a disk of two or more sheets is contained. The disk magazine which can be divided into the top-face section and the inferior-surface-of-tongue section, The chassis unit equipped with said disk magazine, and the magazine division section which makes said disk magazine with which said chassis unit was equipped divide and coalesce, The disk selection section which chooses a desired disk, and the swing unit transferred between the divided up-and-down disk magazines, It is prepared on said swing unit and has the following technical features in the disk unit which has the disk playback section which plays the disk chosen by said disk selection section.

[0017] That is, a vertical guide hole is formed in either [at least] the top-face section of said disk magazine, or the inferior-surface-of-tongue section, and invention according to claim 1 is characterized by preparing the guide shaft of the perpendicularly it inserts in said guide hole at the time of division of said disk magazine and coalesce in said chassis unit. In the above invention according to claim 1, in case the magazine division section divides a disk magazine, the top-face section or the inferior-surface-of-tongue section of a disk magazine moves perpendicularly. A guide shaft inserts in the guide hole formed in the top-face section or the inferior-surface-of-tongue section which moves at this time. And in case a disk magazine is coalesced, since migration of the magazine top-face section or the inferior-surface-of-tongue section is guided by the guide shaft inserted in the guide hole, a location gap is prevented and a malfunction does not arise by it.

[0018] Invention according to claim 2 said magazine division section The magazine electrode holder which grasped the top-face section or the inferior-surface-of-tongue section of said disk magazine, and was prepared in said chassis unit possible [rise and fall], It has the cylindrical cam prepared in said chassis unit rotatable, and the driving source which rotates said cylindrical cam. An electrode-holder guide pin is prepared in the end of said magazine electrode holder, a spiral cam is formed in the lateral surface of said cylindrical cam, and it is characterized by inserting said electrode-holder guide pin in said spiral cam. In the above invention according to claim 2, by the cylindrical cam to which the depth (before or after) direction and the width-of-face (right and left) direction do not take a comparison-tooth space, since a magazine electrode holder is moved up and down, space-efficient member arrangement is attained and the miniaturization of the whole equipment becomes easy.

[0019] Invention according to claim 3 is set to a disk unit according to claim 2. Said magazine division section said chassis unit -- order -- a slide -- with the magazine shift plate prepared movable It has the transfer device in which the driving force of said driving source is transmitted to said magazine shift plate. Said cylindrical cam and said magazine shift plate Insert said magazine electrode holder in between, and it is arranged in the opposite side the transfer side of said disk playback section. To said said cylindrical-cam [in said magazine electrode holder], and magazine shift plate side An electrode-holder guide pin is prepared, respectively and an inclination cam die is prepared in said magazine shift plate. One electrode-holder guide pin of said magazine electrode holder It is characterized by being inserted in the spiral cam of said cylindrical cam, and inserting the electrode-holder guide pin of another side in the inclination cam die of said magazine shift plate. Although a depth tooth space becomes short

in the above invention according to claim 3 in the transfer side of the disk playback section in a magazine electrode holder, since the depth stroke with a long cylindrical cam is unnecessary, trouble does not have it in rise and fall of a magazine electrode holder. Moreover, since the transfer side of the disk playback section and the opposite side tend to secure a depth tooth space, although they need a depth stroke, they can shorten the cross direction of equipment by using the magazine shift plate which does not need to take width of face. Therefore, transfer structure of the disk playback section and rise-and-fall structure of a magazine electrode holder can be realized to a narrow tooth space, and the whole disk unit can be miniaturized to it.

[0020] Said disk playback section is supported for invention according to claim 4 through two or more absorbers on said swing unit, and at least one of said two or more absorbers is characterized by being the movable absorber which was able to prepare between the stowed position in the movable range of said disk playback section, and the evacuation locations from which it separates from the movable range of said disk playback section movable. In the above invention according to claim 4, after swing unit transfer can save necessary area by containing a movable absorber to a stowed position at the time of swing unit standby, without spoiling the oscillating reduction function by the absorber by removing a movable absorber from the movable range of the disk playback section, and performing disk playback.

[0021] Invention according to claim 5 is set to a disk unit according to claim 4. Before transfer of said swing unit It considers as the floating lock condition which regulates the variation rate of said disk playback section. After transfer of said swing unit The floating lock device which makes said disk playback section floating by support of only said absorber is established. When said disk playback section is in a floating lock condition When said movable absorber is in a stowed position and said disk playback section is in a floating lock condition, it is characterized by establishing the gear device in which said floating lock device and said movable absorber are synchronized so that said movable absorber may come to an evacuation location. In the above invention according to claim 5, since migration of a movable absorber can be synchronized with a floating lock device, it can limit, when absorber support is required, and a movable absorber can be moved to an evacuation location.

[0022] Invention according to claim 6 is characterized by preparing the attaching part holding the tip of said transferred swing unit in said chassis unit. In the above invention according to claim 6, at the time of the disk playback by the disk playback section, since the tip of a swing unit is held by the attaching part, it becomes the rotation supporting point and two-point support with an attaching part, and becomes strong to vibration.

[0023] In a disk unit according to claim 6, invention according to claim 7 is characterized by preparing the hold arm holding the edge of the opposite side with said swing unit tip held at said attaching part, when said swing unit is transferred. In the above invention according to claim 7, since the opposite end is held by the hold arm at the time of the disk playback by the disk playback section while the tip of a swing unit is held by the attaching part, it becomes three-point support of the rotation supporting point, an attaching part, and a hold arm, and becomes stronger to vibration.

[0024] In a disk unit according to claim 7, invention according to claim 8 is characterized by preparing the hold plate which presses said hold arm in the swing unit maintenance direction, when said swing unit is transferred. In the above invention according to claim 8, since a hold plate presses a hold arm at the time of the disk playback by the disk playback section while three swing units are supported by the rotation supporting point, an attaching part, and the hold arm, it is held still more firmly.

[0025] Moreover, the tray of two or more sheets is prepared multistory in the case which consists of a top-face plate, an inferior-surface-of-tongue plate, and a side-face plate, and the disk magazine of this invention has the following technical features from the opening side face in said case in the disk magazine which can hold a disk between said trays.

[0026] That is, invention according to claim 9 is characterized by forming the notch in the opening side-face side at least at one side by the side of said top-face plate and said inferior surface of tongue. Since the disk held in the disk magazine is mostly covered with a magazine top-face plate and a magazine inferior-surface-of-tongue plate in the above invention according to claim 9, in case a disk magazine is detached and attached to a disk unit, there is no possibility of damaging a disk. Moreover, if it extrudes a

little in order to remove a disk, a disk periphery will be exposed in a notch. Therefore, it can pull out easily by holding and taking out the exposed disk edge, without touching the signal side with a disk. [0027] a disk discharge lever is prepared rotatable in an opening side face and the opposite side, and it becomes possible for the end of said disk discharge lever to press a disk -- as -- the edge of a disk -- contacting -- the other end of said disk discharge lever -- the rotation from the outside -- it is characterized by having exposed so that it may become operational. [in / on a disk magazine according to claim 9 and / in invention according to claim 10 / said case] In the above invention according to claim 10, by operating and rotating a disk discharge lever from the outside, a disk can be extruded easily, the disk edge exposed in the notch can be held, and it can pull out easily.

[0028]

[Embodiment of the Invention] [1. The gestalt of the 1st operation implementation of the 1st of gestalt] this invention is explained below with reference to drawing 1 - drawing 42 .

[0029] 1-1. The disk unit of the gestalt of whole configuration 1-1-1. configuration book operation of the gestalt of the 1st operation is constituted by preparing two or more following units on the chassis unit 1 equipped with the case 100 of a disk magazine, as shown in drawing 1 and drawing 2 .

[0030] ** The magazine ejection unit 600 (refer to drawing 13) which divides the magazine case 100 up and down, is prepared on the up-and-down unit 300** up-and-down unit 300 which chooses the disk D of the magazine shift unit 200** purpose which secures a playback tooth space in the meantime, and discharges the drive unit 500** magazine case 100 which was prepared on the swing unit 400** swing unit 400 transferred to the playback tooth space of the divided magazine case 100, and was equipped with optical pickup

Hereafter, these configurations are explained in full detail.

[0031] 1-1-2. Explain the configuration of disk magazine **** and a disk magazine with reference to drawing 3 -6. In addition, the bold arrow in drawing 3 - 6 is the path of insertion of the magazine case 100 to the chassis unit 1. That is, as shown in drawing 3 , it is divided on the tray 110 of five sheets which the interior holds Disk D according to an individual, and holds the magazine case 100 of a thin form. This magazine case 100 is formed in the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 possible [division]. The configuration of each part is as follows.

[0032] ** Each tray 110 which divides the inside of the tray magazine case 100 is the member of light-gage discoid, as shown in drawing 4 . Two tray support pawls 111 projected outside are formed in two places (edge under drawing Nakagami) to which that periphery counters this tray 110. Inside two tray support pawls 111 in the inferior surface of tongue of a tray 110, the planet gear 112 is attached rotatable, respectively. Disk support pawl 112a which supports the inferior surface of tongue of the disk D with which the tray 110 was equipped is prepared in these two planet gears 112.

[0033] The lobe 116 projected outside is formed in the edge of the magazine path of insertion (the direction of an arrow head of drawing 4) in a tray 110. Gear slot 116a is formed in the edge of this lobe 116. And the wave-like 1st slot 114 is formed between the lobe 116 and the tray support pawl 111 of the near. Moreover, the wave-like 2nd slot 115 is formed near this and the tray support pawl 111 of the side which counters.

[0034] Furthermore, the specification part 113 of the shape of radii which the periphery of Disk D contacts is formed in the semicircle part on the left-hand side of drawing 4 in a tray 110. And another tray support pawl 111 is formed near the pars intermedia of this semicircle part.

[0035] ** Explain the configuration of the magazine top-face section magazine top-face section 120 with reference to drawing 5 . In addition, drawing 5 is the perspective view which looked up at the magazine top-face section 120 from the background. That is, the magazine top-face section 120 is constituted by the top-face plate 121 and the side-face plate 122. The top-face plate 121 is a plate which formed abbreviation square-like one corner in the shape of radii. The side-face plate 122 is a plate of a cross-section L typeface, and is formed in three corners except a radii-like corner. Inside these three side-face plates 122, side-attachment-wall 122a of the shape of a curved surface which the perimeter of a tray 110 contacts is formed.

[0036] And the top slit section 123 which supports a tray 110 to the magazine top-face section 120 side

is formed in the location corresponding to three corners at the top-face plate 121. Slit 123a in which three tray support pawls 111 of each tray 110 are inserted, respectively is formed in the besides side slit section 123. The number of slit 123a is the number of sheets and the same number (the gestalt of this operation five) of a tray 110.

[0037] The maximum upper case is formed for a long time among such slit 123a compared with other stages. Furthermore, gear slot 123c to which a planet gear 112 engages with each partition 123b is formed in the two (drawing 5 is located up and down) slit sections 123 which counter. This gear slot 123c is prepared near the edge of the opposite side with the open end in which the tray support pawl 111 is inserted.

[0038] Moreover, the tray hold arm 124 is formed rotatable inside [on the other hand / (lower part of drawing 5)] the side-face plate 122 which counters the top-face plate 121. This tray hold arm 124 is torsion coiled-spring 124a Depended, and is energized in the direction in which that tip engages with the 1st slot 114 of a tray 110.

[0039] And the disk discharge lever 125 for discharging the disk D held between each tray 110 according to an individual with hand control is formed in the corner of the side (left of drawing 5) which counters the corner of the shape of radii in the top-face plate 121. The number of these disk discharge levers 125 is the number of disk hold, and the same number (the gestalt of this operation five). The disk discharge lever 125 is formed rotatable respectively independently, and the tip is energized by extension spring 125a in the direction which separates from Disk D.

[0040] Furthermore, near the tray hold arm 124 in the top-face plate 121, and the disk discharge lever 125, the guide hole 126 in which two guide shafts 3 mentioned later, respectively are inserted is formed.

[0041] ** The magazine inferior-surface-of-tongue section magazine inferior-surface-of-tongue section 130 is constituted by the top-face plate 121 and the inferior-surface-of-tongue plate 131 of the same configuration as shown in drawing 6 . The bottom slit section 132 which holds a tray 110 to the magazine inferior-surface-of-tongue section 130 side, respectively is formed in the location corresponding to the three top slit sections 123 by the side of the magazine top-face section 120 at the inferior-surface-of-tongue plate 131. Same number formation of the slit 132a in which the tray support pawl 111 of each tray 110 is inserted is carried out with the number of sheets of a tray 110 at this bottom slit section 132. Slit 132a of the maximum upper case is short formed among this slit 132a compared with other stages.

[0042] Such five slit 132a of the bottom slit section 132 constitutes five steps of slits which continued horizontally with slit 123a of the top slit section 123, when it is in the condition that the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 coalesced, as shown in drawing 7 .

[0043] Moreover, the disk hold arm 133 is formed in the corner of the magazine path of insertion (the direction of an arrow head of drawing 6) in the magazine inferior-surface-of-tongue section 130 rotatable. In the tray hold arm 124 in the magazine top-face section 120, this disk hold arm 133 is located in the opposite side, and is energized in the direction in which that tip engages with the 2nd slot 115 of a tray 110 by torsion coiled spring 133a. Furthermore, rectangle-like hollow 131a is formed in the location which visited the magazine path of insertion in the outsole side of the inferior-surface-of-tongue plate 131.

[0044] 1-1-3. a magazine shift unit -- raise the magazine top-face section 120 of the above configurations, and explain the configuration of the magazine shift unit 200 which divides the magazine case 100 according to drawing 8 - drawing 12 . In addition, let the upper part of drawing 8 into back, and let a lower part be the front. This magazine shift unit 200 is constituted by the magazine electrode holder 210, the cylindrical cam 220, the synchro gear 230, and the magazine shift plate 240 grade. The configuration of each part is as follows.

[0045] ** It is the member crooked in cross-section horseshoe-shaped in the plate, and the top face is formed in the almost same configuration as the magazine top-face section 121 so that the magazine electrode-holder magazine electrode holder 210 may cover the top-face plate 121 and both its side of the magazine top-face section 120, as shown in drawing 8 and drawing 11 . this magazine electrode holder

210 -- the inside of the chassis unit 1 -- up and down -- a slide -- it is prepared movable.

[0046] The frame-like magazine insertion opening 2 is formed in the anterior part of the chassis unit 1 so that the front end of the magazine electrode holder 210 may be surrounded. One guide shaft 3 projected perpendicularly is being caudad fixed to the head-lining side of this magazine insertion opening 2 at a time by right and left. And when the magazine electrode holder 210 moves up and down, two insertion hole 210a which the two above-mentioned guide shafts 3 insert in by non-contact, respectively is formed in the top face of the magazine electrode holder 210. Moreover, inside the side face of right and left of the magazine electrode holder 210, bottom grasping pawl 210b which grasps the inserted top-face plate 121 of the magazine top-face section 120 is prepared.

[0047] On the other hand, bottom grasping pawl 2a which grasps the inserted inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130 is prepared in the medial surface of right and left of the magazine insertion opening 2 in the chassis unit 1. In addition, return section 210c opened outside and 2b are formed in the front end of the magazine electrode holder 210 with which the magazine case 100 is inserted, and the front end of the base of the magazine insertion opening 2.

[0048] And as shown in drawing 12 and drawing 8, two are prepared in the right lateral of the magazine electrode holder 210, and one electrode-holder guide pin 211 is formed in the left lateral. right-hand side electrode-holder guide slot 1a by which two right-hand side electrode-holder guide pins 211 were formed in the chassis unit 1 -- a slide -- it is inserted in movable. Two trains of this right-hand side electrode-holder guide slot 1a are formed perpendicularly at the right lateral of the chassis unit 1. left-hand side electrode-holder guide slot 2c by which one left-hand side electrode-holder guide pin 211 was formed in the magazine insertion opening 2 -- a slide -- it is inserted in movable. One train of this left-hand side electrode-holder guide slot 2c is formed perpendicularly at the left lateral of the magazine insertion opening 2.

[0049] Furthermore, as shown in drawing 9 and drawing 11, the tray guide 212 is formed in the posterior part of the magazine electrode holder 210. This tray guide 212 is the member of an inverted-L character form, and screw stop immobilization of the part for that horizontal level is carried out on the top face of the magazine electrode holder 210. Slit 212a corresponding to the number of trays 110 is formed in the perpendicular part of the tray guide 212, and it has at it the composition that the lobe 116 of each tray 110 which rotated to each slit 212a enters.

[0050] ** The cylindrical-cam cylindrical cam 220 is formed in the left side of the magazine insertion opening 2 in the chassis unit 1 rotatable centering on the vertical shaft, as shown in drawing 8 and drawing 9. Spiral cam 220a is formed in the perimeter of a cylindrical cam 220, and the electrode-holder guide pin 211 of the magazine electrode holder 210 is engaging with this spiral cam 220a. Moreover, worm-gear 220b is formed in the perimeter of the lower part of a cylindrical cam 220. This worm-gear 220b constitutes the worm gear by engaging with worm 221a which tells the driving force of the magazine shift motor 221 attached in the chassis unit 1. Furthermore, disc-like gear 220c which is a spur gear is formed in the lowest edge of a cylindrical cam 220.

[0051] ** The synchro gear synchro gear 230 is constituted by the 1st disk section 231 and the 2nd disk section 232 which were prepared in the outsole side of the chassis unit 1 as shown in drawing 8. The 1st disk section 231 and the 2nd disk section 232 adjoin right and left, and are arranged, and the core is established in them rotatable as a shaft, respectively. While circular gear 231a which engages with disc-like gear 220c of a cylindrical cam 220 is formed in the 1st disk section 231, circular gear 231b is formed in the location which counters this circular gear 231a.

[0052] While circular gear 232a which engages with circular gear 231b of the 1st disk section 231 is formed in the 2nd disk section 232, circular gear 232b is formed in the location which counters this circular gear 232a. In addition, the amount of rotation is regulated so that engagement of the circular gears 231b and 232a may not separate from the 1st disk section 231 and the 2nd disk section 232.

[0053] ** it is shown in the right lateral of the magazine SHIFUTOPURETO chassis unit 1 at drawing 8 and drawing 12 -- as -- the magazine shift plate 240 -- order -- a slide -- it is prepared movable. Two inclination cam dies 242 are mutually formed in the vertical plane of this magazine shift plate 240 in parallel. An inclination cam die 242 has the shape of a straight line which inclined from the front,

respectively so that it might become low according to back. and -- this inclination cam die 242 -- the electrode-holder guide pin 211 of the magazine electrode holder 210 -- a slide -- it is inserted in movable.

[0054] Moreover, as the lower limit of the magazine shift plate 240 is shown in drawing 8, it has the horizontal plane crooked in accordance with the angle of the base of the chassis unit 1, and the rack 241 for a magazine shift is formed in ***** of this horizontal plane. This rack 241 for a magazine shift is engaging with circular gear 232b in the 2nd disk section 232.

[0055] 1-1-4. In order to choose the disk D which carries out up-and-down unit playback, explain the configuration of the up-and-down unit 300 which determines the division location of the magazine case 100 according to drawing 13 - drawing 20. In addition, let the upper part of drawing 13 into back, and let a lower part be the front. This up-and-down unit 300 is constituted by the loading gear 310, the post-shift plate 320, the link plate 330, the left shift plate 340, the up-and-down chassis 350, and the drive unit 360 grade. The configuration of each part is as follows.

[0056] ** The loading gear loading gear 310 is formed in the back right corner of the base of the chassis unit 1, as shown in drawing 13. upper case gear 310a which is the intermittent gear whose toothless part is about 3/4 yen as this loading gear 310 is shown in drawing 14, and the middle where the spur gear was formed in the perimeter -- gear 310b and lower-berth gear 310c which is the intermittent gear whose toothless part is semicircle extent have three-step composition constituted by one. and the driving force of the loading motor 311 attached in the chassis unit 1 -- transfer gear group 311a -- minding -- the middle -- it has composition transmitted to gear 310b.

[0057] ** a back side face [in / as the shift-after back shift plate plate 320 is shown in drawing 13 / the chassis unit 1] -- right and left -- a slide -- it is prepared movable. After this, the lower limit of the shift plate 320 has the horizontal plane crooked in accordance with the angle of the base of the chassis unit 1, and the rack 321 for an up-and-down shift is formed in the first transition of this horizontal plane. This rack 321 for an up-and-down shift is formed in the height which engages with lower-berth gear 310c of the loading gear 310. Furthermore, as shown in the rear view of drawing 15, the posterior part stair-like cam 322 of two articles which becomes low according to the left (from Hidari to the right [Seeing from a transverse-plane side.]) is formed in the vertical plane of the post-shift plate 320 from the right.

[0058] ** As the link plate link plate 330 is shown in drawing 13, it is a sector member and the top-most-vertices section 331 is attached in the outsole side of the chassis unit 1 rotatable. Moreover, the back edge of the radii part of the link plate 330 is connected with the left end section of the horizontal plane in the post-shift plate 320 rotatable.

[0059] ** the left shift plate left shift plate 340 is shown in drawing 13 -- as -- the left side face of the chassis unit 1 -- order -- a slide -- it is prepared movable. This left shift plate 340 has the horizontal plane crooked in accordance with the angle of the base of the chassis unit 1, and the front edge of the radii part of the link plate 330 is connected with the back end of this horizontal plane rotatable. As shown in drawing 16, the left part stair-like cam 341 of one articles which becomes low according to back is formed in the vertical plane in the left shift plate 340 from the front.

[0060] ** The up-and-down chassis up-and-down chassis 350 is the plate of the horizontal plane of an abbreviation L typeface over the left part from the back side of the chassis unit 1, as shown in drawing 13. the configurations with this following up-and-down chassis 350 -- the inside of the chassis unit 1 -- up and down -- a slide -- it is prepared movable. That is, as shown in drawing 15, the vertical plane along the back side face of the chassis unit 1 is formed in the posterior part of the up-and-down chassis 350, and two up-and-down guide pins 351 are formed in this vertical plane. the posterior part stair-like cam 322 of two articles by which these two up-and-down guide pins 351 were formed in the post-shift plate 320 -- respectively -- a slide -- it is inserted in movable.

[0061] Moreover, as shown in drawing 16, the vertical plane which met the left lateral of the chassis unit 1 is formed in the left part of the up-and-down chassis 350, and one up-and-down guide pin 351 is formed in this vertical plane. the left part stair-like cam 341 of one articles by which this up-and-down guide pin 351 was formed in the left shift plate 340 -- a slide -- it is inserted in movable.

[0062] ** On the above drive unit up-and-down chassis 350, as shown in drawing 17 and drawing 18,

the drive unit 360 which rotates a tray 110 is formed. This drive unit 360 is constituted by a drive motor 361, the transfer gear group 362, the mode gear 363, the brush switch 364, the cam gear 365, the tray gear 366, and the tray gear arm 367 grade.

[0063] The transfer gear group 362 consists of two or more gears which transmit the driving force of a drive motor 361 to the mode gear 363. The mode gear 363 is a disc-like spur gear which transmits the driving force from the transfer gear group 362 to the cam gear 365. and it is shown in drawing 19 -- as -- this mode gear 363 -- this and the same axle -- and the brush switch 364 which synchronizes and rotates is formed. Contact v-z of the brush switch 364 is set up so that it can detect which phase has actuation of equipment according to the rotation location of the mode gear 363. The completion of transfer of the swing chassis 420 and y support to release of the disk D of disk support pawl 112a, and, specifically, z supports [the standby condition that the swing chassis 420 is standing by / v /, and w / lock discharge of the magazine case 100 and x] floating lock discharge of the drive base 510.

[0064] As the cam gear 365 is shown in drawing 20, disc-like up gear 365a which is a spur gear, and lower gear 365b which has the two toothless sections and which is an intermittent gear are constituted by one. Up gear 365a is engaging with the mode gear 363. Moreover, ring-like of operation cam-groove 365c is formed in the top face of up gear 365b. This of operation cam-groove 365c has 365d of two U sections which curved to shaft orientations.

[0065] The tray gear 366 is a cylindrical gear of height comparable as the thickness of the magazine case 100, as shown in drawing 17 and drawing 18. This tray gear 366 was formed in the front end of the tray gear arm 367 of L typeface rotatable centering on the vertical shaft, and meshes to up gear 365a of the cam gear 365. The back end of the tray gear arm 367 is prepared in the drive unit 360 rotatable. And tray gear arm rotation pin 367a is attached in the tray gear arm 367 near [the] the back end. This tray gear arm rotation pin 367a is engaging with of operation cam-groove 365c of the cam gear 365.

[0066] 1-1-5. Explain the swing unit 400 transferred between the magazine cases 100 by which swing unit division was carried out according to drawing 21 - drawing 22. Let the upper part of drawing 21 into back, and let a lower part be the front. This swing unit 400 is constituted by the power plate 410, the swing chassis 420, and the hold device 430 grade. The configuration of each part is as follows.

[0067] ** the power plate power plate 410 -- the outsole side of the up-and-down chassis 350 -- right and left -- a slide -- it is prepared movable. The rack 411 for a transfer drive which engages with lower gear 365b of the cam gear 365 is formed in the first transition near the right end of this power plate 410. Moreover, near the center section of the power plate 410, the narrow diameter cylinder-like power roller 412 is being fixed. Furthermore, near the left end section of the power plate 410, the cam 413 for a hold drive of a longitudinal direction is formed. This cam 413 for a hold drive has the level difference which shifts to forward and backward in the middle, bordering on this level difference, left-hand side is become to back horizontal level 413a, and right-hand side has become front horizontal level 413b.

[0068] ** The swing chassis swing chassis 420 is the plate of the shape of an abbreviation triangle established on the up-and-down chassis 350. This swing chassis 420 is formed rotatable focusing on the transfer rotation shaft 421 prepared near [that] the right end section. And the hook-like notch 422 is formed in the right end section of the swing chassis 420. The power roller 412 formed in the power plate 410 is engaging with this hook-like notch 422. Moreover, the projection 423 for a hold is formed in the back side face of the swing chassis 420 near [the] the left end section. Furthermore, the contact pawl 424 is formed in the front end section of the swing chassis 420.

[0069] On the other hand, as shown in drawing 22, when the swing chassis 420 is transferred, the V character slit 6 with which the contact section 424 engages is formed in the right lateral of the chassis unit 1. Corresponding to change of the height of the swing chassis 420, two or more steps of this V character slit 6 are formed.

[0070] ** The hold device hold device 430 is constituted by the hold arm 431, the hold link 432, and the hold plate 433 as shown in drawing 21. The hold arm 431 is the plate of L typeface, and the front end is prepared rotatable near the front end section on the up-and-down chassis 350. Hold hole 431a which engages with the projection 423 for a hold of the transferred swing chassis 420 is formed in the back end of this hold arm 431. Furthermore, the hold arm 431 is energized so that it may rotate clockwise by

extension spring 431b. However, as shown in drawing 21 , when the swing chassis 420 is in a standby condition, since it is pressed by the left lateral of the swing chassis 420, the energization force of extension spring 431b is resisted, it rotates counterclockwise, and the hold arm 431 is held at the left lateral side of the chassis unit 1.

[0071] The hold link 432 is the plate attached in the outsole side of the up-and-down chassis 420 rotatable. Hold link pin 432a is prepared in the back end of this hold link 432. Hold link pin 432a is inserted in the cam 413 for a hold drive of the power plate 410. Moreover, the left end of the hold link 432 is connected with the back end of the hold plate 433 rotatable.

[0072] the hold plate 433 -- the outsole side of the up-and-down chassis 420 -- order -- a slide -- it is prepared movable. The back end of the rotated hold arm 431 is contacted, and press section 433a to press is prepared in the front end of this hold plate 433.

[0073] 1-1-6. Explain the drive unit 500 which plays the disk D by which drive unit selection was made according to drawing 23 - drawing 26 . the upper part of drawing 23 and drawing 25 -- back and a lower part -- before ** -- this drive unit 500 is constituted by the drive base 510, a turntable 520, the optical pickup 530, the delivery device 540, and the floating lock device 550 grade. The configuration of each part is as follows.

[0074] ** The three drive based live bases 510 are supported on the swing chassis 420 by three dampers 511, as shown in drawing 23 . One cone projection 510a is prepared in the left lateral of the drive base 510, and two cone projection 510a is prepared in the right lateral. When transferred in the divided magazine case 100, the tray guide projection 512 which contacts the edge of the tray 110 held in the magazine top-face section 120 side is formed in the top face of the back left corner of the drive base 510.

[0075] ** a turntable -- the turntable 520 is attached in such the drive base 510 as shown in drawing 23 and drawing 24 (A). This turntable 520 is formed pivotable by the spindle motor 521. As shown in drawing 24 (B) and (C), the sleeve 522 whose cross section is the barrel of a convex configuration is formed in the perimeter of the revolving shaft on a turntable 520. This sleeve 522 is energized up with the spring 523. The disk insertion section 524 of the shape of a ring inserted in the hole of the center of Disk D is formed in the perimeter of a sleeve 522.

[0076] The disk hook 525 which moors to the hole of the inserted-in disk D and is held is formed in the disk insertion section 524 at intervals of [equal] three. Mooring section 525a which upheaved so that it might moor to the hole of Disk D is formed in the upper limit outside of the disk hook 525. That lower limit section outside is established in this disk hook 525 rotatable as supporting-point 525b.

Furthermore, since the lower limit section of a sleeve 522 has contacted from the lower part inside [lower limit section] the disk hook 525, the disk hook 525 is energized with the spring 523 so that the mooring section 525a may open outside.

[0077] ** As shown in optical pickup, a delivery device, and drawing 23 , on the drive base 510, the optical pickup 530 and its delivery device 540 are carried. The optical pickup 530 is the head equipped with the lens 531 grade for reading to optical the information recorded on Disk D. The delivery device 540 is a device in which the slide migration of the optical pickup 530 is made to carry out in the direction of a path of the disk D on a turntable 520. namely, the guide rail 541 and feed screw 542 which have been arranged in parallel mutually -- the optical pickup 530 -- a slide -- it is prepared movable. And the feed screw 542 has pivotable composition according to actuation of the delivery motor 543.

[0078] ** The floating lock device floating lock device 550 is a device which locks floating of the drive base 510 supported by the absorber 511, as shown in drawing 25 . This floating lock device 550 is constituted by the lock link 551, the 1st lock plate 552, the 2nd lock plate 553, the reverse link 554, and the extension spring 555.

[0079] The lock link 551 is the plate prepared rotatable near the hook-like notch 422 in the swing chassis 420. The posterior part right end of this lock link 551 is established in the location which contacts the power roller 412 of the power plate 410. The front end of the lock link 551 is connected with the right end section of the 1st lock plate 552 rotatable.

[0080] this 1st lock plate 552 -- the swing chassis 420 top -- right and left -- a slide -- it is the plate

prepared movable. And the vertical plane started perpendicularly is formed in the right-hand side edge of the 1st lock plate 552. Lock hole 552a which two cone projection 510a on the right-hand side of the drive base 510 inserts in is formed in this vertical plane. Moreover, between two lock hole 552a of a vertical plane, tray guide side 552b which contacts the edge of a tray 110 at the time of rotation of the tray 110 in the magazine case 100 is prepared.

[0081] the direction where the 2nd lock plate 553 is parallel to the 1st lock plate 552 on the swing chassis 420 on the other hand -- a slide -- it is prepared movable. The vertical plane started perpendicularly is formed in the left-hand side edge of the 2nd lock plate 553. Lock hole 553a which one cone projection 510a on the left-hand side of the drive base 510 inserts in is formed in this vertical plane.

[0082] And between the 1st lock plate 552 and the 2nd lock plate 553 in the swing chassis 420, the reverse link 554 is formed rotatable. The back end of this reverse link 554 is connected with the 1st lock plate 552 rotatable. The front end section of the reverse link 554 is inserted in concave notch 553b prepared in the 2nd lock plate 553. Therefore, since actuation of the 1st lock plate 552 is transmitted to the 2nd lock plate 553 as a motion of hard flow through the reverse link 554, two lock plates 552,553 interlock and have composition which carries out slide migration to hard flow.

[0083] Furthermore, since Hooks 552c and 553c are formed in the swing chassis 420 and the 2nd lock plate 553, respectively and the both ends of an extension spring 555 are engaging with these hooks 552c and 553c, it is energized in the direction close to the 2nd lock plate 553 and the 1st lock plate 552.

[0084] In addition, the arrangement of the floating lock device 550 in a floating lock condition and the drive base 510 is as follows. That is, the drive base 510 is arranged between the vertical planes of the 1st lock plate 552 on the swing chassis 420, and the 2nd lock plate 553. And since the vertical plane of the 1st lock plate 552 and the 2nd lock plate 553 is energized by the energization force of an extension spring 555 in the direction approached mutually, as shown in drawing 26 (A) and (B), cone projection 510a of the drive base 510 is inserted in the lock holes 552a and 553a of each vertical plane. Therefore, the motion is regulated by the lock holes 552a and 553a in which cone projection 510a was inserted while the drive base 510 is grasped by the vertical plane of the 1st lock plate 552 and the 2nd lock plate 553 from both sides.

[0085] 1-1-7. Explain the magazine ejection unit 600 for discharging the magazine ejection unit magazine case 100 from the chassis unit 1 below according to drawing 13. In addition, let the upper part of drawing 13 into back, and let a lower part be the front. This magazine ejection unit 600 is constituted by the loading plate 610, the loading arm 620, and the extrusion member 630. The configuration of each part is as follows.

[0086] ** the loading plate loading plate 610 -- the outsole side of the chassis unit 1 -- right and left -- a slide -- it is the plate of the abbreviation L typeface prepared movable. Near the back right end section of a loading plate 610, the small rack 611 which engages with upper case gear 310a of the loading gear 310 is formed. Moreover, the abbreviation rectangle-like clipping section 612 is formed in the anterior part of a loading plate 610. Crevice 612a is formed in the posterior part right corner in this clipping section 612, and hook 612b is formed in the anterior part right corner.

[0087] ** The loading-arm loading arm 620 is attached in the location which laps with the loading plate 610 in the outsole side of the chassis unit 1 rotatable. The press pawl 621 is formed in the right end of this loading arm 620. Near the revolving shaft of a loading arm 620, the heights 622 which engaged with crevice 612a of a loading plate 610 are formed. The hook 623 is formed in the left of the heights 622 in a loading arm 620. The both ends of an extension spring 640 are engaging with hook 612b of a loading plate 610, and the hook 623 of a loading arm 620. And the left end of a loading plate 610 is connected with the back end of the extrusion member 630 rotatable.

[0088] ** the extrusion member extrusion member 630 -- the chassis unit 1 -- order -- a slide -- it is prepared movable. When the magazine case 100 is inserted, the catch section 631 which engages with hollow 131a of the outsole side of the magazine inferior-surface-of-tongue section 130 is formed in the front end section of this knockout member 630.

[0089] 1-1-8. The switch and sensors for switching starting of the magazine shift motor 221, the loading

motor 311, a drive motor 361, a spindle motor 521, and delivery motor 543 grade to the arrangement pan of switches at the chassis unit 1 are arranged as follows.

[0090] That is, as shown in drawing 27, the loading start switch 10 is formed behind [right lateral] the chassis unit 1. This loading start switch 10 is a switch which detects the inserted magazine case 100 having drawn and having come to the starting position by contacting the press pawl 621 of a loading arm 620. Moreover, on the back chassis unit 1, ejection and a switch 11 are formed rather than the loading start switch 10. This ejection and switch 11 are a switch which detects the completion of discharge of the magazine case 100 by contacting the press pawl 621.

[0091] Moreover, the magazine closing switch 12, the chucking switch 13, and the magazine opening switch 14 are formed in the right lateral of the chassis unit 1 from the front. These are switches which detect the height of the magazine electrode holder 210 from the location of the magazine shift plate 240. That is, the height of the magazine electrode holder 210 is set as the three-stage of a magazine insertion discharge location (the minimum location), a disk chucking location (mid-position), and a magazine open position (the highest location). And corresponding to the location of these magazine electrode holders 210, each above-mentioned switch is arranged so that it may become detectable about each location of the magazine shift plate 240. The magazine closing switch 12 is a switch which detects the minimum location, the chucking switch 13 is a switch which detects the mid-position, and, specifically, the magazine opening switch 14 is a switch which detects the highest location.

[0092] And on the left-hand side of the chassis unit 1, the photosensor 15 which detects rise and fall of the up-and-down chassis 350, and the standby switch 16 which detects that the swing unit 400 transfers and it is in a front standby condition are formed from the back.

[0093] 1-2. an operation of the gestalt of the 1st operation -- the outline of the above actuation of the gestalt of this operation is as following A-L.

[0094] [A] If a user inserts the magazine case 100 from the magazine insertion opening 2 of the chassis unit 1, the magazine case 100 will be drawn by the magazine ejection unit 600 in the chassis unit 1 (magazine loading actuation).

[0095] [B] By the up-and-down unit 300, raise the up-and-down chassis 350 and choose the division location of the magazine case 100 (disk selection actuation).

[0096] [C] By the tray gear 366 of the drive unit 360, rotate a tray 110 and cancel the lock of the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 (magazine lock discharge actuation).

[0097] [D] By the magazine shift unit 200, the magazine electrode holder 210 is raised, raise the magazine top-face section 120, divide the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 up and down, and secure the transfer tooth space of the swing unit 400 (magazine division actuation).

[0098] [E] Transfer the swing chassis 420 by the swing unit 400 between the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 (swing unit transfer actuation).

[0099] [F] Drop the magazine electrode holder 210 by the magazine shift unit 200, and set the disk D held at the tray 110 of the bottom in the magazine top-face section 120 on a turntable 520 (disk chucking actuation).

[0100] [G] By the magazine shift unit 200, raise the magazine electrode holder 210 and secure the playback tooth space of Disk D (magazine evacuation actuation).

[0101] [H] The floating lock by the floating lock device 550 is canceled, and let the drive base 510 be floating (floating lock discharge actuation).

[0102] The disk D on a turntable 520 is played by the [I] optical pickup 530 (disk playback actuation).

[0103] [J] Raise the magazine electrode holder 210 and release a tray 110 from on a turntable 520, after dropping the magazine electrode holder 210 by the magazine shift unit 200 and holding the disk D on a turntable 520 on a tray 110 again (disk re-receipt actuation).

[0104] [K] Shake out the swing chassis 420 by the swing unit 400 from between the magazine top-face section 120 and the magazine inferior-surface-of-tongue sections 130 (swing unit start actuation).

[0105] [L] Drop the magazine electrode holder 210 and make the magazine top face 120 and the

magazine inferior-surface-of-tongue section 130 coalesce by the magazine shift unit 200 (magazine coalesce actuation).

[0106] [M] Drop the up-and-down chassis 350 and return to an initial valve position (up-and-down chassis downward actuation).

[0107] [N] Discharge the magazine case 100 from the magazine insertion opening 2 by the magazine ejection unit 600 (disk discharge actuation). Hereafter, these actuation is explained in full detail.

[0108] 1-2-1. The magazine case 100 with which the magazine insertion actuation ** magazine coalesce condition chassis unit 1 is equipped is in the lock condition that division with the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 was regulated, as shown in drawing 28 . That is, as partition 123b which constitutes the top slit section 123 of the maximum upper case is shown in drawing 7 , it is formed for a long time than other stages, and partition 132b which constitutes the bottom slit section 132 corresponding to this is formed shorter than slit 123a of other stages. For this reason, as for the boundary part of the top slit section 123 and the bottom slit section 132, the maximum upper case has shifted to the direction of the under-surface [than other stages] slit section 132.

[0109] Since it has this composition, in the condition, i.e., the condition that all the tray support pawls 111 have visited the direction of the bottom slit section 132, before rotating a tray 110, only the tray support pawl 111 of the maximum upper case was located ranging over the boundary of the top slit section 123 and the bottom slit section 132, and the tray support pawl 111 of the lower berth is completely contained in the bottom slit section 132 side. Thus, since it is regulated that both the slit section 123,132 shifts in the vertical direction by straddling the boundary of the top slit section 123 and the bottom slit section 132, the tray support pawl 111 of the maximum upper case is in the lock condition which the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 cannot divide up and down.

[0110] Moreover, since the tip of the disk hold arm 133 engages with the 1st slot 114 of each tray 110 and the tip of the tray hold arm 124 is engaging with the 2nd slot 115, the rotation is regulated and the lock condition is held. In this magazine case 100, Disk D is inserted corresponding to each tray 110, and the inferior surface of tongue of each disk D is held by disk support pawl 112a of a planet gear 112. Since the tip of the disk hold arm 133 is in contact with the edge of Disk D, the elutriation of Disk D is prevented.

[0111] In addition, the ejection activity of Disk D is as follows. That is, when a user energizes with a finger the edge (right end section in drawing 28) of the disk discharge lever 125 prepared corresponding to each tray 110 to the front, the disk discharge lever 125 is rotated clockwise. Then, since the corresponding disk D is extruded by the edge (left end section in drawing 28) of the disk discharge lever 125 from the magazine case 100, a user pulls out the disk D.

[0112] ** In the initial state which is not inserting initial-state **** and the magazine case 100, as shown in drawing 13 , the extrusion member 630 is ahead and the small rack 611 of a loading plate 610 has got into gear to upper case gear 310a of the loading gear 310. The rack 321 for an up-and-down shift of the post-shift plate 310 is in the toothless part of lower-berth gear 310c of the loading gear 310, and is in the condition of not being engaged.

[0113] ** in the condition of ***** of a magazine case, as shown in drawing 13 , when the magazine case 100 was inserted from the magazine insertion opening 2 of the chassis unit 1 towards the corner of the shape of the radii serving as a method of the left rear, the catch section 631 of the extrusion member 630 was formed in the inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130 -- become depressed and engage with 131a. Moreover, as shown in drawing 10 and drawing 11 , the edge of right and left of the magazine top-face section 120 is inserted between the magazine electrode holder 210 and its bottom grasping pawl 210b, and the edge of right and left of the magazine inferior-surface-of-tongue section 130 is inserted between the chassis unit 1 and bottom grasping pawl 2a.

[0114] ** If the magazine case 100 is back stuffed into a loading initiation pan, since the extrusion member 620 will carry out slide migration in back and will press the left end of a loading arm 620 back, a loading arm 620 rotates clockwise. Then, since the press pawl 621 at the right end of a loading arm

620 presses the loading start switch 10 of the right lateral of the chassis unit 1, the loading motor 311 starts. the driving force of the loading motor 311 -- transfer gear group 311a -- minding -- the middle -- since it is transmitted to gear 310b, the loading gear 310 rotates clockwise.

[0115] As mentioned above, since upper case gear 310a of the loading gear 310 is engaging with the small rack 611 of a loading plate 610, a loading plate 610 carries out slide migration of it leftward by rotation of the clockwise rotation of the loading gear 310. Then, since crevice 612a of a loading plate 610 energizes the heights 622 of a loading arm 620 leftward, a loading arm 620 rotates further clockwise and moves the extrusion member 630 back. Therefore, as shown in drawing 29, the catch section 631 which engaged with hollow 131a draws the magazine case 100 back further.

[0116] ** Since the toothless part of upper case gear 310a of the loading gear 310 will face to the small rack 611 of a loading plate 610 when the loading completion extrusion member 630 arrives at the last edge, a loading plate 610 suspends slide migration and a loading arm 620 remains in a loading completion location.

[0117] Thus, if equipped with the magazine case 100 in the chassis unit 1, as shown in drawing 30, the edge of the tray 110 in the magazine case 100 will contact tray guide side 552b prepared in the 1st lock plate 552 of a drive unit 500.

[0118] 1-2-2. the drive of a shift-after disk selection actuation ** plate -- when the loading gear 310 rotates in drawing-in actuation of the above magazine cases 100 further clockwise succeedingly, as it is shown in it at drawing 29, the gearing section of lower-berth gear 310c engages with the rack 321 for an up-and-down shift of the post-shift plate 320. Then, since the post-shift plate 320 carries out slide migration rightward, the up-and-down guide pin 351 of the posterior part of the up-and-down chassis 350 is energized up by the posterior part stair-like cam 322 of two articles shown in drawing 15.

[0119] ** Since the back end of the link plate 330 connected with the drive coincidence of a left shift plate at the left end of the post-shift plate 320 is energized rightward, the link plate 330 rotates clockwise. The left shift plate 340 connected with the front end of the link plate 330 is energized back, and carries out slide migration. Therefore, the up-and-down guide pin 351 of the left part of the up-and-down chassis 350 is energized up by the left part stair-like cam 341 of the left shift plate 340 shown in drawing 16.

[0120] ** a rise of an up-and-down chassis and a halt -- as mentioned above, since the up-and-down guide pin 351 is energized up, the up-and-down chassis 350 goes up gradually from the location of the tray 110 of the bottom. And if it is detected by photosensor 15 that the up-and-down chassis 350 came to the location corresponding to the desired tray 110 (here a top to the 3rd step of tray 110), a stop signal will be sent to the loading motor 311, and the loading gear 311 will stop. Therefore, the post-shift plate 320 stops and the up-and-down chassis 350 stops.

[0121] 1-2-3. In the initial state of the magazine lock discharge actuation ** initial-state drive unit 360, as shown in drawing 30, tray gear arm rotation pin 367a of the tray gear arm 367 is in the location from which it separated from 365d of the U sections in of operation cam-groove 365c. Therefore, the tray gear arm 367 was rotated clockwise and the tray gear 366 at the tip of the tray gear arm 367 is separated from gear slot 116a formed in the tray 110 in the magazine case 100. Moreover, since the toothless part of lower gear 365b of the cam gear 365 is facing to the rack 411 for a transfer drive of the power plate 410 as shown in drawing 21, the power plate 420 has stopped.

[0122] ** the rise of a drive unit -- from the above initial states, if disk selection actuation by rise of the up-and-down chassis 350 is performed as mentioned above, the drive unit 360 will go up with a rise of the up-and-down chassis 350. Then, as gear slot 116a of the tray 110 of the stage beyond it indicates it in drawing 30 as gear slot 116a of the desired tray 110 (here a top to the 3rd step of tray 110) further, it counters by the tray gear 366 and non-contact.

[0123] ** Start rotation of a tray, next a drive motor 361, and as shown in drawing 32, rotate the cam gear 365 counterclockwise. Then, since tray gear arm rotation pin 367a goes into 365d of the U sections of of operation cam-groove 365c, the tray gear arm 367 rotates counterclockwise. Then, since the tray gear 366 moves ahead, it gears to gear slot 116a of the tray 110 of three sheets which counters this. Since the tray gear 366 meshes to up gear 365a of the cam gear 365, the tray gear 366 is clockwise

rotated with the rotation to the counterclockwise rotation of the cam gear 365.

[0124] For this reason, the tray 110 of three sheets rotates counterclockwise to coincidence. Since the perimeter of a tray 110 is in contact with side-attachment-wall 122a (drawing 28) prepared in the magazine top-face section 120 side, and tray guide side 552b by the side of a drive unit 550 (drawing 30), rotation is stabilized. And if a tray 110 rotates in this way, the lobe 116 in which the gear slot 116a was formed will go into slit 212a (drawing 8 , drawing 11) of the tray guide 212 corresponding to this.

[0125] ** If the tray 110 of three sheets of the discharge upper case of a lock rotates, the tray support pawl 111 of the perimeter will go into slit 123a of the top slit section 123, as shown in drawing 33 and drawing 34 . Since the tray support pawl 111 of the maximum upper case also moves to the top slit section 123 side from the boundary part of the maximum upper case of the top slit section 123 and the bottom slit section 132 at this time, the member which regulates a gap of the vertical direction of both the slit section 123,132 is lost. Therefore, the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 will be in the condition that the lock was canceled. And since the tray support pawl 111 will be supported by only the top slit section 123, the tray 110 of three sheets which rotated is released from the magazine inferior-surface-of-tongue section 130, is lifted with the magazine top-face section 120, and will be in a possible condition.

[0126] ** a halt of a tray gear -- if a tray 110 carries out specified quantity rotation as mentioned above, as shown in drawing 35 , tray gear arm rotation pin 367a will separate from 365d of the U sections of of operation cam-groove 365c. Therefore, since the tray gear arm 367 rotates clockwise and the tray gear 366 moves back, it separates from gear slot 116a of a tray 110. Since the brush switch 364 shown in drawing 19 comes to the magazine lock discharge location w at this time, a drive motor 361 stops by this detection.

[0127] 1-2-4. a rise of a magazine division actuation ** magazine electrode holder -- start the magazine shift motor 221 and rotate a cylindrical cam 220, after canceling the lock condition of the magazine case 100 as mentioned above. Then, if it is formed in the perimeter of a cylindrical cam 220 as shown in drawing 9 , the electrode-holder guide pin 211 of Hidari of the magazine electrode holder 210 will be energized up by plug-like cam 220a. Disc-like gear 220c of a cylindrical cam 220 makes coincidence rotate the 2nd disk section 232 through the 1st disk section 231. Since the rack 241 for a magazine shift of the magazine shift plate 240 is engaging with circular gear 232b of the 2nd disk section 232, the magazine shift plate 240 carries out slide migration with rotation of the 2nd disk section 232 in back. Therefore, as shown in drawing 12 , the electrode-holder guide pin 211 on the right of the magazine electrode holder 210 is energized up by the inclination cam die 242 formed in the magazine shift plate 240.

[0128] Thus, if the electrode-holder guide pin 211 is energized up, as shown in drawing 36 , the magazine electrode holder 210 will go up even to a magazine open position (the highest location), the location of the magazine shift plate 240 at this time will be detected by the magazine opening switch 14, and the magazine shift motor 221 will stop.

[0129] ** division of a magazine -- as a rise of the above magazine electrode holders 210 shows to drawing 36 and drawing 37 , although the magazine top-face section 120 grasped by bottom grasping pawl 210b is raised with the tray 110 of three sheets, since the magazine inferior-surface-of-tongue section 130 is grasped by bottom grasping pawl 2a of the chassis unit 1, it remains caudad with the tray 110 of two sheets. Therefore, the magazine case 100 will be divided up and down in the interior of the chassis unit 1.

[0130] Since the guide shaft 3 inserts in insertion hole 210a of the magazine electrode holder 210 and is further inserted in the guide hole 126 of the magazine top-face section 120 at this time, the longitudinal slide movement of the magazine top-face section 120 is regulated. And as for the tray 110 of three sheets lifted with the magazine top-face section 120, the lobe 116 is contained in slit 212a of the tray guide 212. Therefore, if the support around each tray 110 is totaled with the support for three tray support pawls 111, it will be supported four points and will not hang down in the specific direction.

[0131] 1-2-5. Start the drive motor 361 of the drive unit 360 again after the completion of division of the rotation magazine case 100 of a swing unit transfer actuation ** swing chassis, and rotate the cam gear

365 counterclockwise. Then, since the gear slot of lower gear 365b in the cam gear 365 gears to the rack 411 for a transfer drive of the power plate 410 as shown in drawing 21 , the power plate 410 carries out slide migration leftward. Since the power roller 412 is engaging with the hook-like notch 422 of the swing chassis 420, with the power roller 412 which moves to the left with the power plate 410, the swing chassis 420 is energized and counterclockwise rotation is started centering on the transfer rotation shaft 421.

[0132] If the swing chassis 420 continues rotation, as shown in drawing 38 , the swing unit 400 whole will be transferred between the magazine top-face sections 120 and the magazine inferior-surface-of-tongue sections 130 which were divided. And since the contact pawl 424 of the point of the swing chassis 420 engages with the V character slit 6 of the chassis unit 1 (refer to drawing 22), rotation of the swing chassis 420 stops it.

[0133] ** Synchronizing with rotation of the swing chassis 420 of the maintenance above of a swing chassis, as shown in drawing 38 , rotate clockwise the hold arm 431 energized by extension spring 431b. If rotation of the swing chassis 420 stops, hold hole 431a at the tip of the hold arm 431 will engage with the projection 423 for a hold of the swing chassis 420. And as shown in drawing 39 , the tray guide projection 512 on the drive base 510 contacts the edge of the tray 110 of three sheets held in the magazine top-face section 120.

[0134] Furthermore, as shown in drawing 38 , after a rotation halt of the swing chassis 420 carries out slide migration on the left, and the power roller 410 separates from the power plate 410 from the hook-like notch 422. And hold link pin 432a of the hold link 432 goes into front horizontal level 413b on the right-hand side of the cam 413 for a hold drive by slide migration to the left of the power plate 410. Then, since it rotates counterclockwise, the hold plate 433 is energized and slide migration of the hold link 432 is carried out ahead.

[0135] Although the hold arm 431 is rotated clockwise as mentioned above and the edge of the swing chassis 420 is pressed down, press section 433a of the hold plate 433 presses the back end of the hold arm 431. Therefore, since the return to the counterclockwise rotation of the hold arm 431 is regulated and the swing chassis 420 is held still more firmly, backlash is prevented. Since the brush switch 364 shown in drawing 19 at this time comes to the completion location x of transfer, a drive motor 361 suspends it by this detection.

[0136] 1-2-6. The drive unit 500 on the disk chucking actuation swing unit 400 transferred as mentioned above is in a floating lock condition, and as shown in drawing 39 , a turntable 520 comes to the location corresponding to the main hole of Disk D. If the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped to a disk chucking location (mid-position) in this condition as shown in drawing 40 , the location of the magazine shift plate 240 at this time will be detected by the chucking switch 13, and the magazine shift motor 221 will stop.

[0137] Thus, if the magazine electrode holder 210 descends to the mid-position, the magazine top-face section 120 held at this will also descend. Then, the disk D held at the 3rd step of tray 110 in the magazine top-face section 120 is pushed against a turntable 520, and the disk insertion section 524 inserts in the main hole of Disk D. At this time, as shown in drawing 24 (B) and (C), the disk hook 525 prepared in the disk insertion section 524 also resists the energization force of a spring 523, and rotates inside focusing on supporting-point 525b, and mooring section 525a inserts it in the main hole of Disk D.

[0138] And if this mooring section 525a bends down to pass under a main hole, the disk hook 525 rotates outside according to the energization force of a spring 523, and since mooring section 525a engages with the upper limit of the main hole of Disk D, Disk D will be held on a turntable 520. At this time, as shown in drawing 41 , only the 3rd step of tray 110 in the magazine top-face section 120 stands face to face against the tray gear 366.

[0139] 1-2-7. Start a drive motor 361 again after rotation disk chucking completion of a disk release actuation ** tray, and rotate the cam gear 365 counterclockwise. Then, since tray gear arm rotation pin 367a goes into 365d of the U sections of of operation cam-groove 365c in up gear 365a as shown in drawing 39 , the tray gear arm 367 rotates counterclockwise. Thereby, the tray gear 366 moves ahead

and meshes again to gear slot 116a of the 3rd step of tray 110 which counters this. By engagement with up gear 365a, since it is rotating clockwise, a tray 110 rotates the tray gear 366 counterclockwise further. In addition, since the perimeter of a tray 110 is in contact with the tray guide projection 512 of side-attachment-wall 122a of the magazine top-face section 120, and the drive base 510, rotation is stabilized.

[0140] ** Since the planet gear 112 of the both ends of a tray 110 will engage with gear slot 123c of the top slit section 123 as shown in drawing 39 if release of a disk, thus the 3rd step of tray 110 rotate counterclockwise, rotate clockwise. Then, disk support pawl 112a of the planet gear 112 which is supporting Disk D evacuates to the outside of Disk D. Therefore, the perimeter of the disk D by which chucking was carried out on the turntable 520 is released. Since that toothless part of lower gear 365b of the cam gear 365 is facing the rack 411 for a transfer drive of the power plate 410 at this time, the power plate 410 has stopped.

[0141] ** Since tray gear arm rotation pin 367a separates from 365d of the U sections of of operation cam-groove 365c as rotation of the counterclockwise rotation of the cam gear 365 shows to the evacuation pan of a tray gear at drawing 42 , the tray gear arm 367 rotates clockwise. Then, the tray gear 366 moves back and it separates from gear slot 116a of a tray 110. Since the brush switch 364 shown in drawing 19 comes to the disk release location y at this time, a drive motor 361 stops by this detection.

[0142] 1-2-8. magazine evacuation actuation -- if the magazine shift motor 221 is started and the magazine electrode holder 210 is raised to a magazine open position (the highest location) after Disk D is released as mentioned above, the location of the magazine shift plate 240 at this time will be detected by the magazine opening switch 14, and the magazine shift motor 221 will stop.

[0143] If the magazine electrode holder 210 goes up to the highest location again, the magazine top-face section 120 held at this will also go up. Therefore, it leaves the disk D of one sheet by which chucking was carried out on the turntable 520, the tray 110 of three sheets in the magazine top-face section 120 is lifted, and path clearance required for playback of Disk D is secured.

[0144] 1-2-9. If a drive motor 361 is started and the cam gear 365 is counterclockwise rotated, after completing floating lock discharge actuation magazine evacuation actuation, since the gear part of lower gear 365b will engage with the rack 411 for a transfer drive of the power plate 410, the power plate 410 carries out slide migration at a left. Then, since the power roller 412 of the power plate 410 contacts the posterior part right end of the lock link 551 as shown in drawing 25 , the lock link 551 rotates counterclockwise. Since the front end of the lock link 551 energizes the 1st lock plate 552, the 1st lock plate 552 resists the energization force of an extension spring 555, and carries out slide migration of it rightward. Therefore, lock hole 552a in the right-hand side vertical plane of the 1st lock plate 552 releases two cone projection 510a on the right-hand side of the drive base 510.

[0145] Since the back end of the reverse link 554 is energized rightward by such the 1st right translation and coincidence of a lock plate 552, the reverse link 554 is rotated clockwise. Then, since the front end is engaging with concave notch 553b of the 2nd lock plate 553, the 2nd lock plate 553 resists the energization force of an extension spring 555, and carries out slide migration of the reverse link 554 at a left. Therefore, lock hole 553a in the left-hand side vertical plane of the 2nd lock plate 553 releases one cone projection 510a on the left-hand side of the drive base 510. Consequently, the drive base 510 will be in floating by three-point support of only an absorber 511. Since the brush switch 354 shown in drawing 19 comes to the floating lock discharge location z at this time, a drive motor 361 stops by this detection.

[0146] 1-2-10. disk playback actuation -- as mentioned above, rotate the disk D on a turntable 520 by starting a spindle motor 521 after making the drive base 510 into floating. And the delivery motor 543 is started, a feed screw 542 is rotated, and read of the information on Disk D and playback are performed by moving the optical pickup 530 along with a guide rail 541.

[0147] Since the drive base 510 is in floating supported only by the absorber 511, the vibration from the outside is absorbed by the absorber 511, the member of a turntable 520 and optical pickup 530 grade is not influenced by vibration, but the exact read of it becomes possible.

[0148] 1-2-11. Explain the activity which contains again the disk D which ended disk re-receipt

actuation playback on the tray 110 in the magazine case 100.

[0149] ** If a drive motor 361 is started and the cam gear 365 is clockwise rotated after suspending rotation of the floating relock actuation turntable 520, the power plate 410 will carry out slide migration at the method of the right by lower gear 365b which engaged with the rack 411 for a transfer drive. Then, since the power roller 412 of the power plate 410 moves rightward as shown in drawing 25, the press to the lock link 551 is solved. The 1st lock plate 552 carries out slide migration leftward according to the energization force of an extension spring 555. Therefore, as shown in drawing 26 (A), lock hole 552a in the right-hand side vertical plane of the 1st lock plate 552 locks cone projection 510a on the right-hand side of the drive base 510.

[0150] Since it can come, simultaneously the back end of the reverse link 554 is energized leftward, the reverse link 554 is rotated counterclockwise. Then, since the energization force of an extension spring 555 works with the energization force of the front end of the reverse link 554, the 2nd lock plate 553 carries out slide migration at the method of the right. Therefore, as shown in drawing 26 (B), lock hole 553a in the left-hand side vertical plane of the 2nd lock plate 553 locks one cone projection 510a on the left-hand side of the drive base 510.

[0151] ** If the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped to a disk chucking location (mid-position) where it carried out the floating lock of the disk re-grasping actuation drive base 510 and a variation rate is regulated, the location of the magazine shift plate 240 at this time will be detected by the chucking switch 13, and the magazine shift motor 221 will stop. Thus, if the magazine electrode holder 210 descends to the mid-position again, the 3rd step of tray 110 of ** in the magazine top-face section 120 will touch the disk D on a turntable 520.

[0152] And if a drive motor 361 is driven succeedingly and the cam gear 365 is rotated clockwise, since tray gear arm rotation pin 367a will go into 365d of the U sections of of operation cam-groove 365a, the tray gear arm 367 rotates counterclockwise. Thereby, the tray gear 366 moves ahead and meshes to gear slot 116a of the 3rd step of tray 110 which counters this. It rotates counterclockwise by engagement with up gear 365a, and the tray gear 366 rotates the tray 110 of three sheets clockwise by this. In addition, since the perimeter of a tray 110 is in contact with side-attachment-wall 122a of the magazine top-face section 120, and the tray guide projection 512, rotation is stabilized.

[0153] Thus, since a planet gear 112 will engage with gear slot 123c of the top slit section 123 as shown in drawing 34 if a tray 110 rotates clockwise, it rotates counterclockwise. Then, disk support pawl 112a goes into Disk D bottom, and supports Disk D. Therefore, the perimeter of the disk D by which chucking was carried out on the turntable 520 is held. Since the toothless part of lower gear 365b is facing the rack 411 for a transfer drive at this time, the power plate 410 has stopped.

[0154] Furthermore, if the cam gear 365 rotates clockwise, since tray gear arm rotation pin 367a will separate from 365d of the U sections of of operation cam-groove 365c, tray gear arm 367a rotates clockwise. Then, the tray gear 366 moves back and it separates from the gear slot 116 of the 3rd step of tray 110.

[0155] ** If the magazine shift motor 221 is started and the magazine electrode holder 210 is raised to a magazine open position (the highest location) in the condition of the disk chucking discharge actuation above, the location of the magazine shift plate 240 at this time will be detected by the magazine opening switch 14, and the magazine shift motor 221 will stop.

[0156] Thus, if the magazine electrode holder 210 goes up to the highest location, the magazine top-face section 120 held at this will also go up. Therefore, the main hole escapes from the disk insertion section 524, and the disk D held by the tray support pawl 111 of the 3rd step of tray 110 goes up with the magazine top-face section 120.

[0157] 1-2-12. swing unit start actuation -- since the gear slot of lower gear 365b will gear on the rack 411 for a transfer drive if the cam gear 365 rotates clockwise after canceling chucking Of Disk D as mentioned above, the power plate 420 carries out slide migration rightward. Then, since the power roller 421 engages with the hook-like notch 422 of the swing chassis 420 again and energizes to the method of the right, the swing chassis 420 transfers and rotation is clockwise started centering on the rotation shaft 421.

[0158] If the swing chassis 420 continues rotation, be shown in drawing 21 . The swing unit 400 whole is shaken out from between the magazine top-face sections 120 and the magazine inferior-surface-of-tongue sections 130 which were divided, and returns to the initial valve position of the method of the left rear of the chassis unit 1.

[0159] Hold link pin 432a of the hold link 432 goes into coincidence by slide migration to the method of the right of the power plate 410 at back horizontal level 423a on the left-hand side of the cam 423 for a hold drive. Then, since it rotates clockwise, the hold plate 433 is energized and slide migration of the hold link 432 is carried out in back.

[0160] Since the front end of the hold plate 433 separates from the hold arm 431 which was pressing down the edge of the swing chassis 420, the energization force of extension spring 431b is resisted with the swing unit 400 which rotates clockwise, it rotates counterclockwise gradually, and the hold arm 431 returns to the location which finally touches the left-hand side edge of the chassis unit 1.

[0161] 1-2-13. descent of a magazine coalesce actuation ** magazine electrode holder -- if the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped even to a magazine insertion discharge location (the minimum location) after the swing unit 400 is shaken out as mentioned above, the location of the magazine shift plate 240 at this time will be detected by the magazine closing switch 12, and the magazine shift motor 221 will stop.

[0162] Thus, the magazine top-face section 120 grasped by the descending magazine electrode holder 210 descends with the tray 110 of three sheets, and coalesces in the magazine inferior-surface-of-tongue section 130 which remained caudad with the tray of two sheets. Since the guide shaft 3 has inserted in insertion hole 210a of the magazine electrode holder 210 at this time, the longitudinal slide movement of the magazine top-face section 120 is regulated, and it coalesces correctly.

[0163] ** If magazine lock actuation and the cam gear 365 rotate further clockwise, since tray gear arm rotation pin 367a will go into 365d of the U sections of of operation cam-groove 365c, the tray gear arm 367 rotates counterclockwise. Then, since the tray gear 366 moves ahead, it gears to gear slot 116a of the tray 110 of three sheets which counters this. By rotation to the clockwise rotation of the cam gear 365, it rotates counterclockwise and the tray 110 of three sheets rotates the tray gear 366 clockwise by this. Since the perimeter of a tray 110 is in contact with side-attachment-wall 122a by the side of the magazine top-face section 120, and tray guide side 552b by the side of a drive unit 550, rotation is stabilized.

[0164] Thus, if a tray 110 rotates, as shown in drawing 28 , the tray support pawl 111 of the perimeter will go into slit 132a by the side of the bottom slit section 132. At this time, as shown in drawing 8 , only the tray support pawl 111 of the maximum upper case was located ranging over the boundary of the top slit section 123 and the bottom slit section 132, and the tray support pawl 111 of that lower berth is completely contained in the bottom slit section 132 side. Therefore, the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 will be in the lock condition which cannot be divided up and down.

[0165] Thus, since tray gear arm rotation pin 367a will separate from 365d of the U sections of of operation cam-groove 365c if the cam gear 365 rotates clockwise succeeding after the magazine case 100 is in a lock condition, the tray gear arm 367 rotates clockwise. Then, since the tray gear 366 moves back, it separates from gear slot 116a of the tray 110 of three sheets which counters this. Since the brush switch 364 shown in drawing 19 comes to the standby condition v at this time, a drive motor 361 stops by this detection.

[0166] 1-2-14. up-and-down chassis downward actuation -- as mentioned above, start the loading motor 311 and rotate the loading gear 310 counterclockwise, after completing coalesce and the lock of the magazine case 100. Then, the gearing section of lower-berth gear 310c engages with the rack 321 for an up-and-down shift of the post-shift plate 320. Then, since the post-shift plate 320 carries out slide migration leftward, the up-and-down guide pin 351 of the up-and-down chassis 350 is caudad energized by the posterior part stair-like cam 322.

[0167] The link plate 330 connected with the left end of the post-shift plate 320 at coincidence rotates counterclockwise, and the left shift plate 340 connected with the front end of the link plate 330 carries

out slide migration ahead. Therefore, the up-and-down guide pin 351 of the up-and-down chassis 350 is caudad energized by the left part stair-like cam 341 of the left shift plate 340.

[0168] As mentioned above, since the up-and-down guide pin 351 is energized caudad, the up-and-down chassis 350 descends and it returns to the early minimum location. And since the toothless part faces the rack 321 for an up-and-down shift, the post-shift plate 320 stops lower-berth gear 310c of the loading gear 310.

[0169] 1-2-15. Since upper case gear 310a will engage with the small rack 611 of a loading plate 610 as shown at drawing 13 if rotation of the counterclockwise rotation of the loading gear 310 is continued to a magazine ejection actuation pan, a loading plate 610 carries out slide migration rightward. Then, since crevice 612a of a loading plate 610 energizes the heights 622 of a loading arm 620 rightward, a loading arm 620 rotates counterclockwise and moves the extrusion member 630 ahead.

[0170] Since the catch section 631 of the knockout member 630 is engaging with hollow 131a of the magazine inferior-surface-of-tongue section 130, the magazine case 100 is extruded with advance of the extrusion member 630. If specified quantity discharge of the magazine case 100 is carried out from the magazine insertion opening 2, since the press pawl 621 at the left end of a loading arm 620 will press ejection and the switch 11 of the chassis unit 1, the loading motor 311 stops and a loading arm 620 remains in the completion location of discharge. In this condition, a user pulls [a user] out the magazine case 100 from the magazine insertion opening 2.

[0171] 1-3. the effectiveness of the gestalt of the 1st operation -- the effectiveness of the above gestalten of this operation is as follows. Namely, what is necessary is just to form the drive unit 360 which rotates a tray 110, and the up-and-down unit 300 which makes it go up and down the drive unit 360, in order to realize these functions with the top slit section 123 in the magazine case 100 and the bottom slit section 132, and the tray support pawl 111 that moves according to rotation of each tray 110, since the lock of the magazine case 100 and maintenance of a tray 110 are possible. Therefore, according to an easy device, lock of the magazine case 100 and lock discharge, disk selection, and support of a tray 110 can be performed, and a miniaturization and low cost-ization are attained. Since especially rotation of a tray 110 rotates a tray 110 by rotating the tray gear 366 which engages and releases gear slot 123c of a tray 110, it can realize positive actuation according to a simple device.

[0172] Moreover, in the condition that the swing unit 400 is not transferred, since the edge of the tray 110 in the magazine case 100 is in contact with tray guide side 552b of the 1st lock plate 552, rotation of the lock of the magazine case 100 and the tray 110 in the case of lock discharge is stabilized, and dependability improves.

[0173] Moreover, since the lobe 116 of a tray 110 is contained in slit 212a of the tray guide 212 in case you make it go up and down the magazine top-face section 120, four perimeters in all of each tray 110 will be supported with three tray support pawls 111, and do not hang down in the specific direction.

[0174] Moreover, in the condition that the swing unit 400 was transferred, since the edge of the tray 110 in the magazine top-face section 120 is in contact with the tray guide projection 512 of the drive base 510, release of Disk D or rotation of the tray 110 in the case of maintenance is stabilized, and dependability improves.

[0175] Moreover, since disk support pawl 112a of a planet gear 112 which rotates with a tray 110 performs disk maintenance, maintenance of a disk and release can be performed by the simple device.

[0176] Moreover, since the tip of the tray hold arm 124 is engaging with the 1st slot 114 of a tray 110, it is prevented that rotation of a tray 110 is regulated, a tray 110 rotates at the time of carrying of the magazine case 100 etc., and a lock is canceled. Since especially both the slit section 123,132 in the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 is formed in three places of tray 110 perimeter, it becomes trustworthy [the above-mentioned lock].

[0177] Moreover, the tip of the disk hold arm 133 engages with the 2nd slot 115 of a tray 110, and since it is in contact with the disk D with which the tray 110 was equipped, the elutriation of Disk D is prevented.

[0178] Moreover, since migration is guided when the guide shaft 3 inserts in the guide hole 126 in case the magazine top-face section 120 goes up and down with the magazine electrode holder 210, there is no

location gap and division and generating of the malfunction at the time of coalesce are prevented.

[0179] Moreover, in order that the depth (before or after) direction and the width-of-face (right and left) direction may not take a comparison-tooth space, it becomes easy to miniaturize [of the whole equipment] the cylindrical cam 220 for making it go up and down the magazine electrode holder 210. In the tooth space which is easy to secure the depth stroke of this and the opposite side to the swing unit 400 side which cannot secure a depth stroke especially easily using a cylindrical cam 220, by using the magazine shift plate 240 which does not take a crosswise tooth space, space-efficient member arrangement is attained and the large miniaturization of the whole equipment can be realized.

[0180] Moreover, since this and the opposite side will be held by the hold arm 431 while the contact pawl 424 at the tip is held by the V character slit 6 if the swing chassis 420 is transferred, three swing chassis 420 will be supported by transfer rotation shaft 425a, the V character slit 6, and the hold arm 431, and become strong to vibration by them. Furthermore, since press section 422a of the hold plate 433 presses the back end of the hold arm 431 at this time, that return is prevented and it is held more firmly.

[0181] Moreover, since chucking of the disk D to a turntable 520 top and a chucking discharge activity can be easily done by making it go up and down the magazine electrode holder 210, and making the disk hook 525 engage and release the main hole of Disk D, the member for pressing down from Disk D specially is not needed, but simplification of a configuration can be realized.

[0182] [2. The gestalt of the 2nd operation implementation of the 2nd of gestalt] this invention is explained below with reference to drawing 43 - drawing 60 . In addition, the same member as the gestalt of the 1st operation of the above attaches the same sign, and omits a part of explanation.

[0183] 2-1. Explain the configuration of configuration 2-1-1. disk magazine **** of the gestalt of the 2nd operation, and a disk magazine. That is, as shown in drawing 43 and drawing 44 , the magazine case 100 is formed in the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 possible [division], and the interior is divided on the tray 110 of five sheets. The configuration of each part is as follows.

[0184] ** As shown in tray drawing 45 , two projections 117 for tray support projected outside are formed in two places to which the periphery counters the tray 110 of light-gage discoid. Inside these two projections 117 for tray support, projection 117a for disk maintenance is formed, respectively. If projection 117a for disk maintenance will project inside, Disk D will be held, if the projection 117 for tray support is pressed, and the press to the projection 117 for tray support is solved, it is prepared possible [elastic deformation] between the projection 117 for tray support, and projection 117a for disk maintenance so that projection 117a for disk maintenance may evacuate outside and Disk D may be released. And another projection 118 for tray support is formed in the periphery of a tray 110 in the middle of two projections 117 for tray support.

[0185] Moreover, between the projection 117 for tray support of one side (lower part in drawing 45), and the middle projection 118 for tray support, another projection 119 for disk maintenance is formed. Suppressed area 119a is formed in the outside of this projection 119 for disk maintenance. And if the projection 119 for disk maintenance will project inside, Disk D will be held, if suppressed area 119a is pressed inside, and the press to suppressed area 119a is solved, it is prepared possible [elastic deformation] between the projection 119 for disk maintenance, and suppressed area 119a so that the projection 119 for disk maintenance may evacuate outside and may release Disk D.

[0186] Gear slot 116a is formed in the side which counters this projection 119 for disk maintenance. Between this gear slot 116a and the projection 117 for tray support of that near, slot 110a for a rotation lock is formed. Moreover, the specification part 113 to which the periphery of Disk D contacts the circular part from the middle projection 118 for tray support to two projections 117 for tray support is formed in the tray 110. Furthermore, flabellate form notch 110b is formed between the middle projection 117 for tray support, and the projection 119 for disk maintenance.

[0187] ** The magazine top-face section magazine top-face section 120 is constituted by the top-face plate 121 and the side-face plate 122 as shown in drawing 46 . Inside three side-face plates 122, side-attachment-wall 122a and the top slit section 123 are formed. As shown in drawing 47 , five steps of slit

123a is formed in the besides side slit section 123, and slit 123a of the maximum upper case is formed in it for a long time compared with other stages.

[0188] And in the two top slit sections 123 which counter, 123d of ridges which upheaved in the direction which goes at the core of Disk D to the medial surface of each slit 123a is formed.

Furthermore, inside the left-hand side side-face plate 122, the press side 127 which contacts suppressed area 119a of a tray 110 is formed between two side-face plates 122 of the lower part in drawing 43 and drawing 46.

[0189] Moreover, as shown in drawing 43 and drawing 45, the tray hold arm 124 prepared in the magazine top-face section 120 is torsion coiled-spring 124a Depended, and is energized in the direction in which the tip engages with slot 110a for a rotation lock of a tray 110. And the disk discharge lever 127 is formed in the location corresponding to flabellate form notch 110b of the tray 110 in the magazine top-face section 120 rotatable. This disk discharge lever 128 is energized by torsion coiled spring 128a in the direction in which that tip separates from Disk D.

[0190] And as shown in drawing 48, the tip of the disk discharge lever 128 corresponded to the height of each tray 110 and is stair-like. Furthermore, the guide hole 126 in which one guide shaft 3 is inserted is formed in the location corresponding to the shaft of the disk discharge lever 128 in the top-face plate 121.

[0191] ** As shown in the inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section magazine inferior-surface-of-tongue section 130 at drawing 49, the three bottom slit sections 132 are formed. And as shown in drawing 50, slit 132a of the maximum upper case is short formed among 5 steps of slit 132a of the bottom slit section 132 compared with other stages.

[0192] 2-1-2. The magazine shift unit magazine shift unit 200 is constituted by the magazine electrode holder 210, the left magazine shift plate 250, the magazine shift link 260, and the right magazine shift plate 270 grade as shown in drawing 51 - drawing 54. The configuration of each part is as follows.

[0193] ** The magazine electrode-holder magazine electrode holder 210 is the almost same configuration as the gestalt of the 1st operation. However, as shown in drawing 51, insertion hole 210a which one guide shaft 3 inserts in by non-contact is prepared in one top face of the magazine electrode holder 210.

[0194] ** the left magazine shift plate left magazine shift plate 250 is shown in drawing 52 -- as -- the left side of the magazine insertion opening 2 -- order -- a slide -- it is prepared movable. One inclination cam die 251 is formed in the vertical plane of this left magazine shift plate 251. This inclination cam die 251 has the shape of a straight line which inclined from the front so that it might become high according to back. and -- an inclination cam die 251 -- the electrode-holder guide pin 211 of the magazine electrode holder 210 -- a slide -- it is inserted in movable.

[0195] Furthermore, the lower limit of the left magazine shift plate 250 has the horizontal plane crooked in accordance with the angle of the base of the chassis unit 1, and the end of the magazine shift link 260 is connected with this horizontal plane rotatable.

[0196] ** As shown in drawing 51, magazine shift RINKUMAGAJINSHIFU Trink 260 is the plate of the shape of a thin rectangle which has the die length of breadth extent of the magazine insertion opening 2, and is attached in the outsole side of the chassis unit 1 rotatable centering on the center. The end of the magazine shift link 260 is connected with the left magazine shift plate 250 rotatable as mentioned above, and the other end is connected with the right magazine shift plate 270 rotatable like the after-mentioned.

[0197] ** the right magazine shift plate right magazine shift plate 270 is shown in drawing 51 and drawing 53 -- as -- the right lateral of the chassis unit 1 -- order -- a slide -- it is prepared movable. The lower limit of the right magazine shift plate 270 has the horizontal plane crooked in accordance with the angle of the base of the chassis unit 1, and is connected with the other end of the magazine shift link 260 rotatable as mentioned above in this horizontal plane.

[0198] Moreover, two inclination cam dies 271 are mutually formed in the vertical plane of the right magazine shift plate 270 in parallel. This inclination cam die 271 has the shape of a straight line which inclined from the front, respectively so that it might become low according to back. and -- these

inclination cam dies 271 -- the electrode-holder guide pin 211 of the magazine electrode holder 210 -- a slide -- it is inserted in movable.

[0199] Furthermore, the rack 272 for a magazine shift is horizontally formed in the back lower limit section of the right magazine shift plate 270. It is engaging with the pinion driven by the magazine shift motor (not shown) on this rack 272 for a magazine shift.

[0200] 2-1-3. Although the up-and-down unit up-and-down unit 300 is the almost same configuration as the gestalt of the 1st operation of the above, it has the following differences.

[0201] ** As shown in drawing 51, the shift cam gear shift cam gears 312 are the loading gear 310 in the gestalt of the 1st operation, and a gear with the same function, and are prepared in the back right corner of the base of the chassis unit 1. the middle this shift cam gear 312 of whose is a small intermittent gear of a path from upper case gear 312a by which the spur gear was formed in the perimeter by the major diameter, and upper case gear 312a -- gear 312b and the middle -- lower-berth gear 312c which is the small intermittent gear of a path has three-step composition constituted by one from gear 312b.

[0202] And upper case gear 312a of the shift cam gear 312 has composition which can transmit the driving force of a loading motor (not shown). moreover, the middle -- gear 312b is prepared in the height corresponding to the rack 321 for an up-and-down shift of the post-shift plate 320.

[0203] ** The drive unit drive unit 370 is constituted by a drive motor 361, the transfer gear 371, the large cam gear 372, the middle gear 373, and the tray gear 374 grade as shown in drawing 51 and drawing 56.

[0204] The transfer gear 371 is a gear which transmits the driving force of a drive motor 361 to the large cam gear 372. The large cam gear 372 constitutes four steps of disc-like gears in one, the maximum upper case transfers, gear 372for driving sources b and the 3rd step are become to gear 372for tray drive c, and the 4th step has become [gear 372for drive a, and the 2nd step] gear 372d for a floating lock drive. Gear 372b for driving sources is a spur gear with a bigger path than other gears, and is engaging with the transfer gear 371.

[0205] Gear 372for transfer drive a and gear 372d for a floating lock drive are intermittent gears which have a radii-like gear part in the one section of a periphery. Gear 372c for a tray drive is an intermittent gear which has the gear part of a periphery short to two places, and the rotation is prepared in the tray gear 374 possible [transfer] through the middle gear 373. furthermore -- the large cam gear 372 -- this and the same axle -- and the brush switch (not shown) which synchronizes and rotates is formed.

[0206] 2-1-4. The swing chassis 425 of the swing unit swing unit 400 is the plate of the shape of an abbreviation triangle established on the up-and-down chassis 350, as shown in drawing 51 and drawing 56. This swing chassis 425 is formed rotatable focusing on transfer rotation shaft 425a near [that] the right end section.

[0207] and it is shown in drawing 56 -- as -- this transfer rotation shaft 425a and same axle -- and transfer rotation gear 425b is prepared rotatable with the swing chassis 425. This transfer rotation gear 425b is the partial gear in which the gear slot was formed at the edge of a brush configuration, and is arranged by the height which can engage with gear 372a for a transfer drive of the upper case of the large cam gear 372.

[0208] 2-1-5. Although the drive unit drive unit 500 is the almost same configuration as the gestalt of the 1st operation of the above, it has the following differences.

[0209] ** As the drive base 510 on the drive base swing chassis 420 is shown in drawing 51 and drawing 56, two places, the anterior part and the right part, are supported by the fixed damper 513, and the back left corner is supported by the movable damper 514. This movable damper 514 is formed in the successive range of optical pickup (not shown), and is laid by un-fixing on the swing chassis 420. And the damper arm 515 is attached in the upper part of the movable damper 514 through damper shaft 514a. This damper arm 515 is a plate with a small waterdrop configuration, an end is prepared on the movable damper 514 and the other end is connected with the corner of the drive base 510 rotatable. Damper arm gear 515a is formed in the perimeter of the other end of this damper arm 515.

[0210] ** The floating lock device floating lock device 550 is constituted by the floating lock gear 556,

the 1st lock plate 552, the 2nd lock plate 553, the reverse link gear 554, and the extension spring 555 as shown in drawing 56 . the floating lock gear 556 -- transfer rotation shaft 425a of the swing chassis 420, and the same axle -- and they are the swing chassis 420 and the gear prepared rotatable independently. [0211] This floating lock gear 556 is a partial gear in which the gear slot was formed at the edge of a brush configuration, and is arranged by the height which can engage with gear 372d for a floating lock drive of the 4th step of the large cam gear 372. Furthermore, a part of floating lock gear 556 is connected with the left end section of the 1st lock plate 552 rotatable.

[0212] And between the 1st lock plate 552 and the 2nd lock plate 553 in the swing chassis 420, the reverse link gear 554 is formed rotatable. The both ends of this reverse link gear 554 are engaging with the rack prepared in the 1st lock plate 552 and 2nd lock plate 553. Therefore, since actuation of the 1st lock plate 552 is transmitted to the 2nd lock plate 553 as a motion of hard flow through the reverse link gear 554, two lock plates 552,553 interlock mutually and have composition which carries out slide migration to hard flow.

[0213] Furthermore, since hook 552c is prepared in the 1st lock plate 552 and the both ends of an extension spring 555 are being engaged between this hook 552c and the swing chassis 420, both the lock plates 552,553 are energized in the direction approached mutually.

[0214] Moreover, the damper rotation gear 516 is formed in the back left end section of the drive base 510. The both ends of this damper rotation gear 516 are engaging with the rack prepared in the 2nd lock plate 552, and damper arm gear 515a. Therefore, actuation of the 2nd lock plate 552 is transmitted to damper arm gear 515a through the damper rotation gear 516, and has composition which the damper arm 515 rotates.

[0215] 2-1-6. The magazine ejection unit magazine ejection unit 600 is constituted by the rack plate 650, the catch arm 660, and the extrusion member 630 grade as shown in drawing 51 .

[0216] ** the front of the shift cam gear [in / in the rack plate rack plate 650 / the base of the chassis unit 1] 312 -- right and left -- a slide -- it is the plate prepared movable. Rack 650a for loading is formed in the location corresponding to lower-berth gear 312c of the shift cam gear 312 at the posterior part of this rack plate 650. Horseshoe-shaped notch 650b is formed in the anterior part of the rack plate 650.

[0217] ** The catch arm catch arm 660 is the plate prepared ahead of the rack plate 650 in the base of the chassis unit 1. The right end of this catch arm 660 is attached rotatable to the chassis unit 1. Protruding object 660a which engages with notch 650b of the rack plate 650 is formed in the back end near the rotation shaft of the catch arm 660.

[0218] Furthermore, the left end of the catch arm 660 is connected with the back end of the extrusion member 630 rotatable. Moreover, the configuration of the extrusion member 630 is the same as that of the gestalt of the 1st operation. In addition, the loading start switch 10 and ejection which detect the rotation location of the catch arm 660, and a switch 11 are formed like the gestalt of the 1st operation.

[0219] 2-2. an operation of the gestalt of the 2nd operation -- the actuation of the above gestalten of the 2nd operation is as follows.

[0220] 2-2-1. The magazine case 100 with which magazine insertion actuation ** magazine coalesce condition **** and the chassis unit 1 are equipped is in the lock condition that division with the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 was regulated. That is, partition 123b which constitutes the top slit section 123 of the maximum upper case is formed like the gestalt of the 1st operation for a long time than other stages, and partition 132b which constitutes the bottom slit section 132 corresponding to this is formed shorter than slit 123a of other stages. For this reason, as for the boundary part of the top slit section 123 and the bottom slit section 132, the maximum upper case has shifted to the direction of the under-surface [than other stages] slit section 132.

[0221] The condition since it has this composition, as it is shown in drawing 57 (A), before rotating a tray 110, namely, in the condition that all projections 117,118 for tray support have visited the direction of the bottom slit section 132 Only the projection 117,118 for tray support of the maximum upper case was located ranging over the boundary of the top slit section 123 and the bottom slit section 132, and the projection 117,118 for tray support of the lower berth is completely contained in the bottom slit section

132 side.

[0222] Thus, when the projection 117,118 for tray support of the maximum upper case straddles the boundary of the top slit section 123 and the bottom slit section 132, it is regulated that both the slit section 123,132 shifts in the vertical direction, and it is in the lock condition which the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 cannot divide up and down.

[0223] ** As shown in an initial state and drawing 51 , in the initial state which is not inserting the magazine case 100, the extrusion member 620 is ahead with the left end of the catch arm 660. In this condition, if the magazine case 100 is inserted from the magazine insertion opening 2 of the chassis unit 1 towards the angle of the shape of those radii serving as a method of the left rear, the catch section 631 of the extrusion member 630 will engage with hollow 131a formed in the outsole side of the inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130.

[0224] Furthermore, if the magazine case 100 is pushed in back, since the extrusion member 620 will carry out slide migration in back and will press the left end of the catch arm 660 back, the catch arm 660 rotates clockwise. Then, with the loading start switch 10, the loading motor 311 starts and the shift cam gear 312 rotates counterclockwise.

[0225] As mentioned above, since lower-berth gear 312c of the shift cam gear 312 is engaging with rack 650a for loading of the rack plate 650, the rack plate 650 carries out slide migration of it rightward by rotation of the counterclockwise rotation of the shift cam gear 312. Then, since notch 650a of the rack plate 650 energizes protruding object 660a of the catch arm 660 rightward, the catch arm 660 rotates further clockwise and moves the extrusion member 630 back. Therefore, the catch section 631 which engaged with hollow 131a draws the magazine case 100 back further.

[0226] Since the toothless part of lower-berth gear 312c of the shift cam gear 312 will face to rack 650a for loading of the rack plate 650 when the knockout member 630 arrives at the last edge, the rack plate 650 suspends slide migration and the catch arm 660 remains in a loading completion location. Thus, if equipped with the magazine case 100 in the chassis unit 1, like the gestalt of the 1st operation, the edge of right and left of the magazine top-face section 120 will be grasped by bottom grasping pawl 210b of the magazine electrode holder 210, and the edge of right and left of the magazine inferior-surface-of-tongue section 130 will be grasped by bottom grasping pawl 2a of the chassis unit 1.

[0227] 2-2-2. disk selection actuation -- if the shift cam gear 312 rotates counterclockwise further succeeding to wearing of the above magazine cases 100 -- the middle -- the gearing section of gear 312b engages with the rack 321 for an up-and-down shift of the post-shift plate 320. Then, since the post-shift plate 320 carries out slide migration leftward, as shown in drawing 55 , the up-and-down guide pin 351 of the posterior part of the up-and-down chassis 350 is energized up by the posterior part stair-like cam 322.

[0228] Like the gestalt of the 1st operation, since the link plate 330 energized with the post-shift plate 320 rotates and the left shift plate 340 carries out slide migration ahead, the up-and-down guide pin 351 of the left part of the up-and-down chassis 350 is energized up by the left part stair-like cam 341 of the left shift plate 340 at coincidence.

[0229] Therefore, the up-and-down guide pin 351 is energized up, and the up-and-down chassis 350 goes up. And if it is detected by photosensor 15 that the up-and-down chassis 350 came to the location corresponding to the desired tray 110 (here a top to the 3rd step of tray 110), a stop signal will be sent to the loading motor 311, and the loading gear 311 will stop. Therefore, the post-shift plate 320 stops and the up-and-down chassis 350 stops.

[0230] 2-2-3. The magazine lock discharge actuation ** initial-state tray gear 366 supports gear slot 116a formed in the tray 110 in the magazine case 100, as shown in drawing 51 . And since the toothless part of gear 372c for a tray drive in the large cam gear 372 is faced, the middle gear 373 has stopped the middle gear 373 and the tray gear 366.

[0231] ** the rise of a drive unit -- from the above initial states, if disk selection actuation by rise of the up-and-down chassis 350 is performed, the drive unit 360 will go up with a rise of the up-and-down chassis 350. Then, gear slot 116a of the tray 110 of the stage beyond it engages with gear slot 116a of the desired tray 110 (here a top to the 3rd step of tray 110) further at the tray gear 366.

[0232] ** Start rotation of a tray, next a drive motor 361, and rotate the large cam gear 372 clockwise. Then, since the gearing part of the gear 372 for a tray drive gears with the middle gear 373 and the middle gear 373 rotates counterclockwise, the tray gear 366 is rotated clockwise. For this reason, the tray 110 of three sheets on which gear slot 116a is engaging with the tray gear 366 rotates counterclockwise to coincidence. At this time, the perimeter of a tray 110 is guided to side-attachment-wall 122a prepared in the magazine top-face section 120 side.

[0233] ** If the discharge tray 110 of a lock rotates, as shown in drawing 57 (B), the projection 117,118 for tray support around each tray 110 will go into slit 123a of the top slit section 123. Since the projection 117,118 for tray support of the maximum upper case also moves to the top slit section 123 side from the boundary part of the maximum upper case of the top slit section 123 and the bottom slit section 132 at this time, the member which regulates a gap of the vertical direction of both the slit section 123,132 is lost. Therefore, the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 will be in the condition that the lock was canceled.

[0234] Since the projection 117,118 for tray support will be supported by only the top slit section 123, the tray 110 of three sheets which rotated is released from the magazine inferior-surface-of-tongue section 130, is lifted with the magazine top-face section 120, and will be in a possible condition. Moreover, since suppressed area 119a is pressed by the press side 127 established in the magazine top-face section 120 while the projection 117 for tray support is pressed inside by 123d of ridges in slit 123a at this time, the projections 117a and 119 for disk maintenance project inside, and hold a disk.

[0235] ** a halt of a tray gear -- since the gearing part of the gear 372 for a tray drive will separate from the middle gear 373 and a toothless part will face if the large cam gear 372 rotates clockwise further after a tray 110 carries out specified quantity rotation as mentioned above, the tray gear 366 stops with the middle gear 373. Therefore, rotation of a tray 110 is also stopped in the state of the above disk maintenance.

[0236] 2-2-4. a rise of a magazine division actuation ** magazine electrode holder -- if a magazine shift motor is started after canceling the lock condition of the magazine case 100 as mentioned above, the right magazine shift plate 270 will carry out slide migration in back. Therefore, as shown in drawing 58, the inclination cam die 271 of the right magazine shift plate 270 energizes the electrode-holder guide pin 211 on the right of the magazine electrode holder 210 up.

[0237] Since the right end of the magazine shift link 260 connected with the right magazine shift plate 270 is back energized as shown in coincidence at drawing 51, the magazine shift link 260 is rotated counterclockwise. Then, as shown in drawing 52, the left magazine shift plate 250 connected with the left end of the magazine shift link 260 is energized ahead, and carries out slide migration. Therefore, the inclination cam die 242 formed in the left magazine shift plate 250 energizes the electrode-holder guide pin 211 of Hidari of the magazine electrode holder 210 up.

[0238] Thus, if the electrode-holder guide pin 211 is energized up, the magazine electrode holder 210 will go up even to a magazine open position (the highest location), the location of the magazine shift plate 240 at this time will be detected by the magazine opening switch 14, and the magazine shift motor 221 will stop.

[0239] ** division of a magazine -- by rise of the above magazine electrode holders 210, like drawing 36, although the magazine top-face section 120 grasped by bottom grasping pawl 210b is raised with the tray 110 of three sheets, since the magazine inferior-surface-of-tongue section 130 is grasped by bottom grasping pawl 2a of the chassis unit 1, it remains caudad with the tray 110 of two sheets. Therefore, the magazine case 100 will be divided up and down in the interior of the chassis unit 1. Moreover, since the disk D by the side of the magazine top-face section 120 is held by the projections 117a and 119 for disk maintenance of a tray 110, it goes up with a tray 110, without falling.

[0240] 2-2-5. A drive motor 361 rotates the large cam gear 372 further clockwise after the completion of division of the rotation magazine case 100 of a swing unit transfer actuation ** swing chassis. Then, since the gearing part of gear 372a for a transfer drive gears to transfer rotation gear 425b, as shown in drawing 59, the swing chassis 420 transfers and counterclockwise rotation is started centering on rotation shaft 425a.

[0241] If the swing chassis 420 continues rotation, the swing unit 400 whole will be transferred between the magazine top-face sections 120 and the magazine inferior-surface-of-tongue sections 130 which were divided. And if a turntable 520 arrives at the pin center, large of Disk D, the edge of the swing chassis 420 will stop in contact with the specification part which was prepared in the up-and-down chassis 350 and which is not illustrated. If completion of such transfer of the swing chassis 420 is detected by the brush switch 364, a drive motor 361 will stop.

[0242] 2-2-6. The drive unit 500 on the disk chucking actuation swing unit 400 transferred as mentioned above is in a floating lock condition, and the turntable 520 of a drive unit 500 is in the location corresponding to the main hole of Disk D. If the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped to a disk chucking location (mid-position) in this condition, the location of the magazine shift plate 240 at this time will be detected by the chucking switch 13, and the magazine shift motor 221 will stop.

[0243] Thus, if the magazine electrode holder 210 descends to the mid-position, the magazine top-face section 120 held at this will also descend. Then, since the disk D held at the 3rd step of tray 110 in the magazine top-face section 120 is pushed against a turntable 520, the disk insertion section 524 inserts in the main hole of Disk D and mooring section 525a of the disk hook 525 engages with the upper limit of the main hole of Disk D, Disk D is held on a turntable 520.

[0244] 2-2-7. A drive motor 361 rotates the large cam gear 372 further clockwise after rotation disk chucking completion of a disk release actuation ** tray. Then, since the gearing part of gear 372c for a tray drive gears with the middle gear 373 and the middle gear 373 rotates counterclockwise, the tray gear 374 is rotated clockwise. For this reason, the tray 110 of three sheets on which gear slot 116a is engaging with the tray gear 366 rotates counterclockwise further.

[0245] ** As shown in drawing 57 (C) at the time of ***** of a disk, since suppressed area 119a separates from the press side 127 established in the magazine top-face section 120 while separating from the projection 117 for tray support from 123d of ridges in slit 123a, the projections 117a and 119 for disk maintenance return outside, and cancel maintenance of Disk D.

[0246] 2-2-8. magazine evacuation actuation -- if the magazine shift motor 221 is started and the magazine electrode holder 210 is raised to a magazine open position (the highest location) after the perimeter of Disk D is released as mentioned above, the location of the magazine shift plate 240 at this time will be detected by the magazine opening switch 14, and the magazine shift motor 221 will stop.

[0247] Thus, if the magazine electrode holder 210 goes up to the highest location again, the magazine top-face section 120 held at this will also go up. Therefore, it leaves the disk D of one sheet by which chucking was carried out on the turntable 520, the tray 110 of three sheets in the magazine top-face section 120 is lifted, and path clearance required for playback of Disk D is secured.

[0248] 2-2-9. Since gear 372d for a floating lock drive will gear with the floating lock gear 556 if the large cam gear 372 rotates further clockwise after completing floating lock discharge actuation magazine evacuation actuation, the floating lock gear 556 rotates counterclockwise. Then, since a part of floating lock gear 556 is connected with the left end section of the 1st lock plate 552 rotatable as shown in drawing 60, the 1st lock plate 552 carries out slide migration in the drawing Nakaya mark direction.

[0249] And since actuation of the 1st lock plate 552 is transmitted to the 2nd lock plate 553 as a motion of hard flow through the reverse link 554, the 2nd lock plate 553 carries out slide migration to the 1st lock plate 552 and hard flow. For this reason, the lock holes 552a and 553a in the 1st and 2nd lock plates 552, 553 release cone projection 511a of the drive base 510.

[0250] Furthermore, since actuation of the 2nd lock plate 552 is transmitted to damper arm gear 515a through the damper rotation gear 516, the damper arm 515 rotates counterclockwise. Then, from the inside of the successive range of the optical pickup 530 (stowed position), the movable absorber 514 evacuates to the outside (playback location) of the drive base 520, and supports the drive base 520 in this condition. Therefore, the drive base 520 will be in floating supported only by two fixed absorbers 513 and one movable absorber 514.

[0251] 2-2-10. As mentioned above, play the disk D on the disk playback actuation turntable 520 after making the drive base 510 into floating. Since the drive base 510 is in floating, the vibration from the

outside is absorbed by the absorber 511, the member of a turntable 520 and optical pickup 530 grade is not influenced by vibration, but the exact read of it becomes possible.

[0252] 2-2-11. Explain the activity which contains again the disk D which ended disk re-receipt actuation playback on the tray 110 in the magazine case 100.

[0253] ** If a drive motor 361 is started and the large cam gear 372 is counterclockwise rotated after suspending rotation of the floating relock actuation turntable 520, the floating lock gear 556 will rotate clockwise. Then, since the 2nd lock plate 553 carries out slide migration at the method of the right while the 1st lock plate 552 carries out slide migration at a left, the lock holes 552a and 553a engage with cone projection 511a of the drive base 510.

[0254] Furthermore, since actuation of the 2nd lock plate 552 is transmitted to damper arm gear 515a through the damper rotation gear 516 and the damper arm 515 rotates clockwise, the movable damper 514 returns in the successive range (stowed position) of the optical pickup 530 from the outside (playback location) of the drive base 520.

[0255] ** If the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped to a disk chucking location (mid-position) where it carried out the floating lock of the disk re-grasping actuation drive base 510 and a variation rate is regulated, the location of the magazine shift plate 240 at this time will be detected by the chucking switch 13, and the magazine shift motor 221 will stop. Thus, if the magazine electrode holder 210 descends to the mid-position again, the 3rd step of tray 110 of ** in the magazine top-face section 120 will approach the disk D on a turntable 520.

[0256] And if the large cam gear 372 is succeedingly rotated counterclockwise with a drive motor 361, since the gearing part of gear 372c for a tray drive will gear with the middle gear 373 and the middle gear 373 will rotate clockwise, the tray gear 374 is rotated counterclockwise. For this reason, the tray 110 of three sheets on which gear slot 116a is engaging with the tray gear 366 rotates clockwise.

[0257] Since suppressed area 119a is pressed by the press side 127 established in the magazine top-face section 120 while the projection 117 for tray support is pressed by 123d of ridges in slit 123a at this time, the projections 117a and 119 for disk maintenance project inside, and hold Disk D.

[0258] ** If the magazine shift motor 221 is started and the magazine electrode holder 210 is raised to a magazine open position (the highest location) in the condition of the disk chucking discharge actuation above, the location of the magazine shift plate 240 at this time will be detected by the magazine opening switch 14, and the magazine shift motor 221 will stop.

[0259] Thus, if the magazine electrode holder 210 goes up to the highest location, the magazine top-face section 120 held at this will also go up. Therefore, the main hole escapes from the disk insertion section 524, and the disk D held by the 3rd step of projections 117a and 119 for disk maintenance of a tray 110 goes up with the magazine top-face section 120.

[0260] ** swing unit start actuation -- rotate the large cam gear 372 counterclockwise with a drive motor 361 after canceling chucking Of Disk D as mentioned above. Then, since the gearing part of gear 372a for a transfer drive gears to transfer rotation gear 425b, the swing chassis 420 transfers and clockwise rotation is started centering on rotation shaft 425a.

[0261] If the swing chassis 420 continues rotation, the swing unit 400 whole will be shaken out from between the magazine top-face sections 120 and the magazine inferior-surface-of-tongue sections 130 which were divided, and will return to the initial valve position of the method of the left rear of the chassis unit 1.

[0262] ** magazine coalesce actuation -- if the magazine shift motor 221 is started and the magazine electrode holder 210 is dropped even to a magazine insertion discharge location (the minimum location) after the swing unit 400 is shaken out as mentioned above, the location of the magazine shift plate 240 at this time will be detected by the magazine closing switch 12, and the magazine shift motor 221 will stop.

[0263] Thus, the magazine top-face section 120 grasped by the descending magazine electrode holder 210 descends with the tray 110 of three sheets, and coalesces in the magazine inferior-surface-of-tongue section 130 which remained caudad with the tray of two sheets.

[0264] ** Rotate magazine lock actuation, next the large cam gear 372 counterclockwise. Then, since

the gearing part of the gear 372 for a tray drive gears with the middle gear 373 and the middle gear 373 rotates clockwise, the tray gear 366 is rotated counterclockwise. For this reason, the tray 110 of three sheets on which gear slot 116a is engaging with the tray gear 366 rotates further clockwise.

[0265] Thus, if a tray 110 rotates, the projection 117,118 for tray support around each tray 110 will go into slit 132a by the side of the bottom slit section 132. At this time, only the projection 117,118 for tray support of the maximum upper case was located ranging over the boundary of the top slit section 123 and the bottom slit section 132, and the projection 117,118 for tray support of that lower berth is completely contained in the bottom slit section 132 side. Therefore, the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130 will be in the lock condition which cannot be divided up and down.

[0266] 2-2-12. up-and-down chassis downward actuation -- as mentioned above, start the loading motor 311 and rotate shift cam gear 312 ** clockwise, after completing coalesce and the lock of the magazine case 100. then, the middle -- the gearing section of gear 312b engages with the rack 321 for an up-and-down shift of the post-shift plate 320. Then, since the post-shift plate 320 carries out slide migration rightward, the up-and-down guide pin 351 of the up-and-down chassis 350 is caudad energized by the posterior part stair-like cam 322.

[0267] Since the link plate 330 energized with the post-shift plate 320 by coincidence rotates and the left shift plate 340 carries out slide migration in back, the up-and-down guide pin 351 of the left part of the up-and-down chassis 350 is caudad energized by the left part stair-like cam 341 of the left shift plate 340.

[0268] As mentioned above, since the up-and-down guide pin 351 is energized caudad, the up-and-down chassis 350 descends and it returns to the early minimum location. and the middle of the shift cam gear 312 -- since the toothless part faces the rack 321 for an up-and-down shift, the post-shift plate 320 stops gear 312b.

[0269] 2-2-14. If rotation of the clockwise rotation of the shift cam gear 312 is continued to a magazine ejection actuation pan, since lower-berth gear 312c will engage with it at rack 650a for loading of the rack plate 650, the rack plate 650 carries out slide migration leftward. Then, since notch 650a of the rack plate 650 energizes protruding object 660a of the catch arm 660 leftward, the catch arm 660 rotates counterclockwise and moves the extrusion member 630 ahead.

[0270] Since the catch section 631 of the knockout member 630 is engaging with hollow 131a of the magazine inferior-surface-of-tongue section 130, the magazine case 100 is extruded with advance of the extrusion member 630. When specified quantity discharge of the magazine case 100 is carried out from the magazine insertion opening 2, with ejection and a switch 11, the loading motor 311 stops and a loading arm 620 remains in the completion location of discharge. In this condition, a user pulls [a user] out the magazine case 100 from the magazine insertion opening 2.

[0271] 2-3. the effectiveness of the gestalt of the 2nd operation -- the effectiveness of the gestalt of these above operations is as follows. That is, since disk maintenance can be performed by forming 123d of ridges in the top slit section 123, without preparing a member like the planet gear 112 in the gestalt of the 1st operation, the lock of the magazine case 100, disk selection, maintenance of a tray 110, disk release, and disk maintenance are realizable with a still simpler configuration. Moreover, since the movable damper 514 is in a stowed position when the SUINGUYU chassis 420 is not transferred, necessary area can be saved and the whole equipment can be contraction-ized. And at the time of swing unit transfer, since the movable damper 514 comes to an evacuation location, the distance between each damper is secured enough and does not spoil an oscillating reduction function.

[0272] Moreover, since rotation of the movable absorber 514 makes it synchronize with the floating lock device 550, when absorber support is required, it can be limited, and can move the movable absorber 514 to an evacuation location.

[0273] [3. The gestalt of the 3rd operation implementation of the 3rd of gestalt] this invention is explained below with reference to drawing 61 .

[0274] 3-1. The disk magazine of the gestalt of configuration book operation is the almost same configuration as the disk magazine of the gestalt of the 1st operation of the above. However, as shown in

drawing 61 , 1st notch 121a is formed in the center of a posterior part of the top-face plate 121 of the magazine top-face section 120. Moreover, ahead [of the top-face plate 121 / left brink], 2nd notch 121b is formed.

[0275] 3-2. the operation effectiveness -- as for the disk D completely held in the magazine case 100, according to the gestalt of these above operations, the periphery is mostly covered with the magazine top-face section 120 and the magazine inferior-surface-of-tongue section 130. Therefore, the disk D exposed at the time of inserting and discharging a magazine to a disk unit and the time of carrying must have been damaged.

[0276] And if the disk discharge lever 125 shown in drawing 28 is rotated and Disk D is discharged a little, a part of periphery of Disk D will be exposed in the 1st notch 121a and 2nd notch 121b which were formed in the magazine top-face section 120. Therefore, by holding the edge of this exposed disk D, it can take out easily, without touching a signal side, and adhesion of the fingerprint at the time of being ejection can be prevented. Furthermore, since the 1st notch 121a and 2nd notch 121b are only formed, a manufacturing cost can also be saved.

[0277] [4. Gestalt] this invention of other operations is not limited to the gestalt of the above operations, and the number of each part material, a configuration, magnitude, etc. can change it suitably. For example, as long as the number of the trays 110 in the magazine case 100 is plurality, it may be how many sheets. Therefore, according to this, the number of slits 123a, 132a, and 212 can also be changed. In addition, in the gestalt of the above-mentioned operation, although the example of operation at the time of choosing the disk D of the tray 110 of the 3rd sheet was explained, the tray 110 of other stages can also be similarly chosen by rise and fall of the up-and-down unit 300.

[0278] Moreover, the notch in the gestalt of the 3rd operation of the above can also be prepared [also preparing in either the top-face plate 121 of the magazine top-face section 120, and the inferior-surface-of-tongue plate 131 of the magazine inferior-surface-of-tongue section 130, and] for both sides. Moreover, the number of notches may not be limited to two, either, but one or three or more are sufficient as it, and the configuration is also free.

[0279] Moreover, although the gestalt of the above-mentioned operation was the configuration of dividing the magazine case 100 by making it going up and down the magazine top-face section 120, it is also possible by constituting the gestalt of the above-mentioned operation to vertical hard flow, and making it go up and down the magazine inferior surface of tongue 120 to consider as the configuration which divides the magazine case 100, is made to carry out chucking of the disk D to the turntable 520 which turned to the lower part, and performs disk playback.

[0280] Furthermore, the record medium used for this invention is not limited to CD etc. that what is necessary is just a disk-like thing. Moreover, this invention can also be constituted only as equipment for playback as equipment in which record and playback are possible.

[Translation done.]

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is the appearance perspective view which looked at the disk unit of the gestalt of operation of the 1st of this invention from the front side.

[Drawing 2] It is the appearance perspective view which looked at the gestalt of operation of drawing 1 from the back side.

[Drawing 3] It is the appearance perspective view showing the disk magazine of the gestalt of operation of the 1st of this invention.

[Drawing 4] It is the perspective view which looked at the tray held in the disk magazine of drawing 3 from the top-face side.

[Drawing 5] It is the perspective view which looked at the magazine top-face section which constitutes the disk magazine of drawing 3 from the rear-face side.

[Drawing 6] It is the perspective view which looked at the magazine inferior-surface-of-tongue section which constitutes the disk magazine of drawing 3 from the top-face side.

[Drawing 7] It is drawing of longitudinal section showing the top slit section and the bottom slit section of a coalesce condition in the disk magazine of drawing 3.

[Drawing 8] the magazine shift unit in the gestalt of operation of drawing 1 is shown -- it is a fluoroscopy top view a part.

[Drawing 9] It is the front view of the magazine shift unit of drawing 8.

[Drawing 10] It is the right side view showing the magazine electrode holder of the magazine shift unit of drawing 8.

[Drawing 11] It is the left side view showing the magazine electrode holder of the magazine shift unit of drawing 8.

[Drawing 12] It is the right side view showing the magazine shift plate of the magazine shift unit of drawing 8.

[Drawing 13] the up-and-down unit and magazine ejection unit in the magazine ejection condition in a gestalt of operation of drawing 1 are shown -- it is a fluoroscopy top view a part.

[Drawing 14] It is the plan (A), side elevation (B), and bottom view (C) showing the up-and-down unit of drawing 13, and the loading gear for a magazine ejection unit drive.

[Drawing 15] It is the rear view showing the post-shift plate of the up-and-down unit of drawing 13.

[Drawing 16] It is the left side view showing the left shift plate of the up-and-down unit of drawing 13.

[Drawing 17] the drive unit on the up-and-down unit of drawing 13 is shown -- it is a fluoroscopy top view a part.

[Drawing 18] It is the rear view showing the drive unit of drawing 17.

[Drawing 19] It is the top view showing the brush switch of the drive unit of drawing 17.

[Drawing 20] It is the plan (A), side elevation (B), and bottom view 8 (C) showing the cam gear of the drive unit of drawing 17.

[Drawing 21] the swing unit in the gestalt of operation of drawing 1 is shown -- it is a fluoroscopy top view a part.

- [Drawing 22] It is the right side view showing the chassis unit in the gestalt of operation of drawing 1 .
- [Drawing 23] It is the top view showing the drive unit in the gestalt of operation of drawing 1 .
- [Drawing 24] They are drawing of longitudinal section (A) showing the disk insertion section in the drive unit of drawing 23 , drawing of longitudinal section (B) showing rotation of a disk hook, and drawing of longitudinal section showing the whole turntable configuration.
- [Drawing 25] the floating lock device in the gestalt of operation of drawing 1 is shown -- it is a fluoroscopy top view a part.
- [Drawing 26] It is the right side view (A) and left side view (B) showing the floating lock condition of the drive unit of drawing 23 .
- [Drawing 27] It is the top view showing the arrangement configuration of the switches in the gestalt of operation of drawing 1 .
- [Drawing 28] It is the fluoroscopy top view of the disk magazine of drawing 3 .
- [Drawing 29] the magazine drawing-in condition of drawing 13 is shown -- it is a fluoroscopy top view a part.
- [Drawing 30] It is the top view showing the physical relationship of the tray at the time of magazine wearing in the gestalt of operation of drawing 1 , and a swing unit.
- [Drawing 31] It is the left side view showing the physical relationship of the tray at the time of magazine wearing in the gestalt of operation of drawing 1 , and a drive unit.
- [Drawing 32] It is the top view showing the location of the tray gear at the time of the magazine lock discharge actuation in the gestalt of operation of drawing 1 .
- [Drawing 33] It is drawing of longitudinal section showing the location of the tray support pawl at the time of the magazine lock discharge actuation in the gestalt of operation of drawing 1 .
- [Drawing 34] It is drawing of longitudinal section showing the tray at the time of the magazine lock discharge actuation in the gestalt of operation of drawing 1 .
- [Drawing 35] It is the top view showing the location of the tray gear at the time of the magazine lock discharge termination in the gestalt of operation of drawing 1 .
- [Drawing 36] It is the front view showing the magazine division condition in the gestalt of operation of drawing 1 .
- [Drawing 37] It is drawing of longitudinal section showing the top slit section and the bottom slit section of a magazine division condition in the gestalt of operation of drawing 1 .
- [Drawing 38] the swing unit after the transfer in the gestalt of operation of drawing 1 is shown -- it is a fluoroscopy top view a part.
- [Drawing 39] It is drawing of longitudinal section showing the time of the disk release in the gestalt of operation of drawing 1 .
- [Drawing 40] It is the front view showing the time of disk chucking in the gestalt of operation of drawing 1 .
- [Drawing 41] It is the left side view showing the drive unit at the time of disk chucking in the gestalt of operation of drawing 1 , and the location of a tray.
- [Drawing 42] It is the top view showing the location of the tray gear at the time of the disk release termination in the gestalt of operation of drawing 1 .
- [Drawing 43] It is the fluoroscopy top view showing the disk magazine of the gestalt of operation of the 2nd of this invention.
- [Drawing 44] It is the front view showing the division condition of the disk magazine of drawing 43 .
- [Drawing 45] It is the top view of the tray held in the disk magazine of drawing 43 .
- [Drawing 46] It is the fluoroscopy top view of the magazine top-face section which constitutes the disk magazine of drawing 43 .
- [Drawing 47] It is the front view showing the top slit section of the magazine top-face section of drawing 46 .
- [Drawing 48] It is the side elevation showing the disk discharge lever of the magazine top-face section of drawing 46 .
- [Drawing 49] It is the perspective view which looked at that of the magazine inferior-surface-of-tongue

section which constitutes the disk magazine of drawing 43 from the top-face side.

[Drawing 50] It is the front view showing the bottom slit section of the magazine inferior-surface-of-tongue section of drawing 49 .

[Drawing 51] the gestalt of operation of the 2nd of this invention is shown -- it is a fluoroscopy top view a part.

[Drawing 52] It is the fluoroscopy left side view showing the magazine shift unit of the gestalt of operation of drawing 51 .

[Drawing 53] It is the fluoroscopy right side view showing the magazine shift unit of the gestalt of operation of drawing 51 .

[Drawing 54] It is the front view showing the magazine shift unit of the gestalt of operation of drawing 51 .

[Drawing 55] It is the rear view showing the up-and-down unit of the gestalt of operation of drawing 51 .

[Drawing 56] the swing unit of the gestalt of operation of drawing 51 is shown -- it is a fluoroscopy top view a part.

[Drawing 57] It is the fluoroscopy top view showing the magazine lock condition (A) in the disk magazine of drawing 43 , magazine lock discharge and a disk maintenance condition (B), and a disk release condition (C).

[Drawing 58] It is the fluoroscopy right side view showing the time of the magazine division in drawing 53 .

[Drawing 59] the swing unit of the transfer condition in the gestalt of operation of drawing 51 is shown - it is a fluoroscopy top view a part.

[Drawing 60] the floating lock discharge and damper evacuation actuation in a gestalt of operation of drawing 51 are shown -- it is a fluoroscopy top view a part.

[Drawing 61] It is the top view showing the disk magazine of the gestalt of operation of the 3rd of this invention.

[Description of Notations]

D -- Disk

1 -- Chassis unit

1a -- Right-hand side electrode-holder guide slot

2 -- Magazine insertion opening

2a -- Bottom grasping pawl

2b, 210c -- Return section

2c -- Left-hand side electrode-holder guide slot

3 -- Guide shaft

6--V character slit

10 -- Loading start switch

11 -- Ejection and switch

12 -- Magazine closing switch

13 -- Chucking switch

14 -- Magazine opening switch

15 -- Photosensor

16 -- Standby switch

100 -- Magazine case

110 -- Tray

110a -- Slot for a rotation lock

110b -- Flabellate form notch

111 -- Tray support pawl

112 -- Planet gear

112a -- Disk support pawl

113 -- Specification part

114 -- The 1st slot
115 -- The 2nd slot
116 -- Lobe
116a -- Gear slot
117,118 -- Projection for tray support
117a, 119 -- Projection for disk maintenance
119a -- Suppressed area
120 -- Magazine top-face section
121 -- Top-face plate
121a -- The 1st notch
121b -- The 2nd notch
122 -- Side-face plate
122a -- Side attachment wall
123 -- Top slit section
123a, 132a, 212a -- Slit
123b, 132b -- Partition
123c -- Gear slot
123d -- Ridge
124,128a -- Tray hold arm
124a -- Torsion coiled spring
125,128 -- Disk discharge lever
125a, 431b, 555,640 -- Extension spring
126 -- Guide hole
127 -- Press side
130 -- Magazine inferior-surface-of-tongue section
131 -- Inferior-surface-of-tongue plate
131a -- Hollow
132 -- Bottom slit section
133 -- Disk hold arm
133a -- Torsion coiled spring
200 -- Magazine shift unit
210 -- Magazine electrode holder
210a -- Insertion hole
210b -- Bottom grasping pawl
211 -- Electrode-holder guide pin
212 -- Tray guide
220 -- Cylindrical cam
220a -- Spiral cam
220b -- Worm gear
220c -- Disc-like gear
221 -- Magazine shift motor
221a -- Worm
230 -- Synchro gear
231 -- The 1st disk section
231a, 231b, 232a, 232b -- Circular gear
232 -- The 2nd disk section
240 -- Magazine shift plate
241,272 -- Rack for a magazine shift
242,251,271 -- Inclination cam die
250 -- Left magazine shift plate
260 -- Magazine shift link

270 -- Right magazine shift plate
300 -- Up-and-down unit
310 -- Loading gear
310a, 312a -- Upper case gear
310b and 312b-- the middle -- a gear
310c, 312c -- Lower-berth gear
311 -- Loading motor
311a, 362,371 -- Transfer gear group
312 -- Shift cam gear
320 -- Back shift plate
321 -- Rack for an up-and-down shift
322 -- Posterior part stair-like cam
330 -- Link plate
331 -- Top-most-vertices section
340 -- Left shift plate
341 -- Left part stair-like cam
350 -- Up-and-down chassis
351 -- Up-and-down guide pin
360,370 -- Drive unit
361 -- Drive motor
363 -- Mode gear
364 -- Brush switch
365 -- Cam gear
365a -- Up gear
365b -- Lower gear
365c -- Cam groove of operation
The 365 d--U sections
366,374 -- Tray gear
367 -- Tray gear arm
367a -- Tray gear arm rotation pin
371 -- Transfer gear
372 -- Large cam gear
372a -- Gear for a transfer drive
372b -- Gear for driving sources
372c -- Gear for a tray drive
372d -- Gear for a floating lock drive
373 -- Middle gear
400 -- Swing unit
410 -- Power plate
411 -- Rack for a transfer drive
412 -- Power roller
413 -- Cam for a hold drive
413a -- Back horizontal level
413b -- Front horizontal level
420 -- Swing chassis
421 -- Transfer rotation shaft
422 -- Hook-like notch
423 -- Projection for a hold
424 -- Contact pawl
425a -- Transfer rotation shaft
425b -- Transfer rotation gear

430 -- Hold device
431 -- Hold arm
431a -- Hold hole
432 -- Hold link
432a -- Hold link pin
433 -- Hold plate
433a -- Press section
500 -- Drive unit
510 -- Drive base
510a -- Cone projection
511 -- Damper
512 -- Tray guide projection
513 -- Fixed damper
514 -- Movable damper
515 -- Damper arm
515a -- Damper arm gear
516 -- Damper rotation gear
520 -- Turntable
521 -- Spindle motor
522 -- Sleeve
523 -- Spring
524 -- Disk insertion section
525 -- Disk hook
525a -- Mooring section
525b -- Supporting point
530 -- Optical pickup
531 -- Lens
540 -- Delivery device
541 -- Guide rail
542 -- Feed screw
543 -- Delivery motor
550 -- Floating lock device
551 -- Lock link
552 -- The 1st lock plate
552a, 553a -- Lock hole
552b -- Tray guide side
552c, 553c -- Hook
553 -- The 2nd lock plate
553b -- Concave notch
554 -- Reverse link
556 -- Floating lock gear
557 -- Reverse link gear
600 -- Magazine ejection unit
610 -- Loading plate
611 -- Smallness rack
612 -- Clipping section
612a -- Crevice
612b, 623 -- Hook
620 -- Loading arm
621 -- Press pawl
622 -- Heights

630 -- Extrusion member
631 -- Catch section
640 -- Extension spring
650 -- Rack plate
650a -- Rack for loading
650b -- Notch
660 -- Catch arm
660a -- Protruding object

[Translation done.]

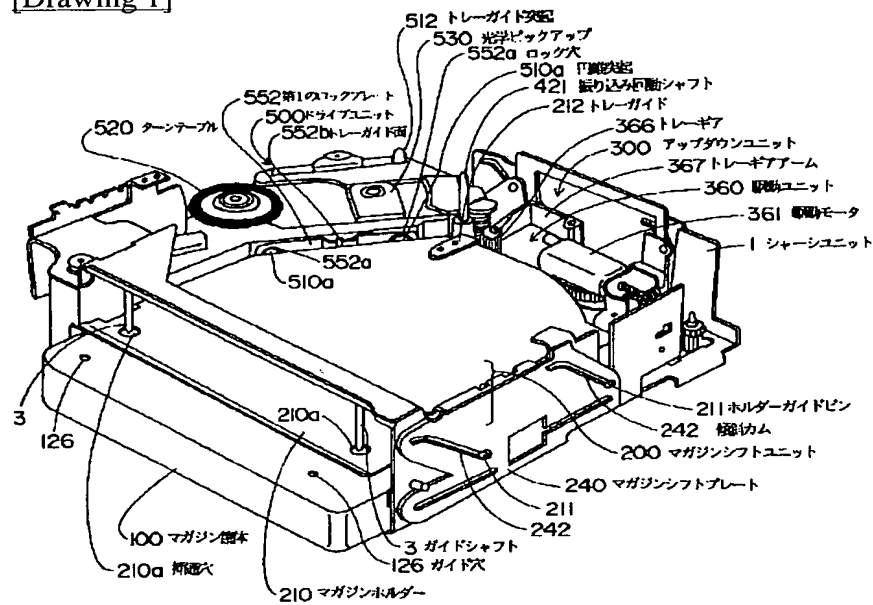
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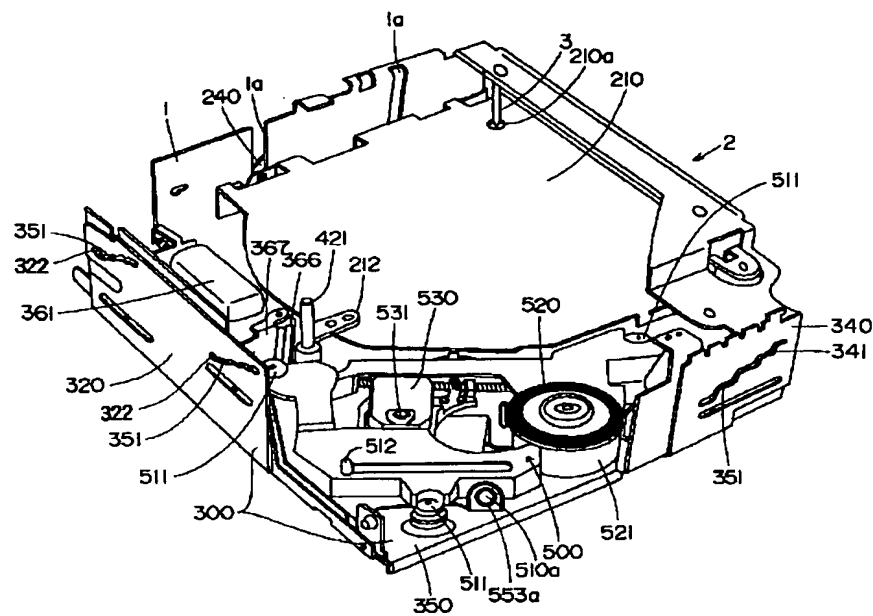
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DRAWINGS

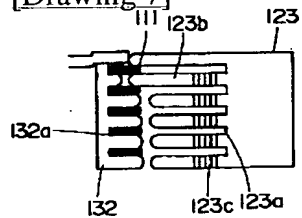
[Drawing 1]



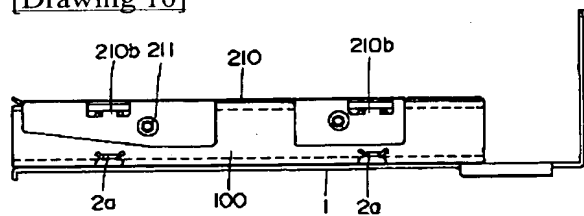
[Drawing 2]



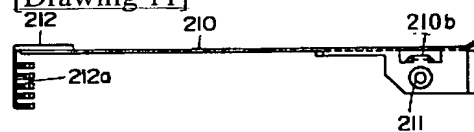
[Drawing 7]



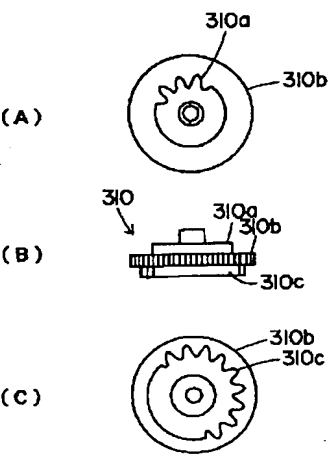
[Drawing 10]



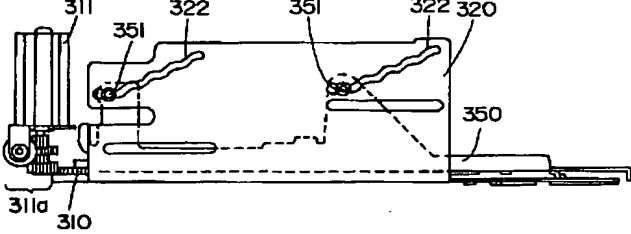
[Drawing 11]



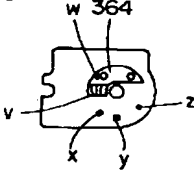
[Drawing 14]



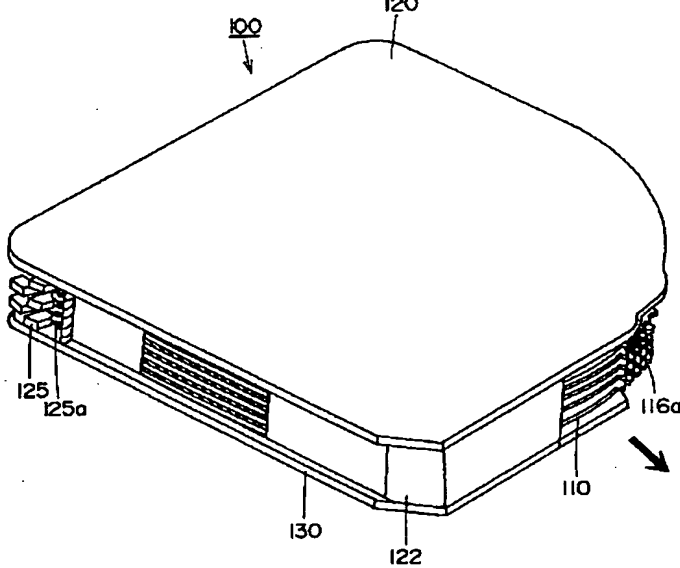
[Drawing 15]



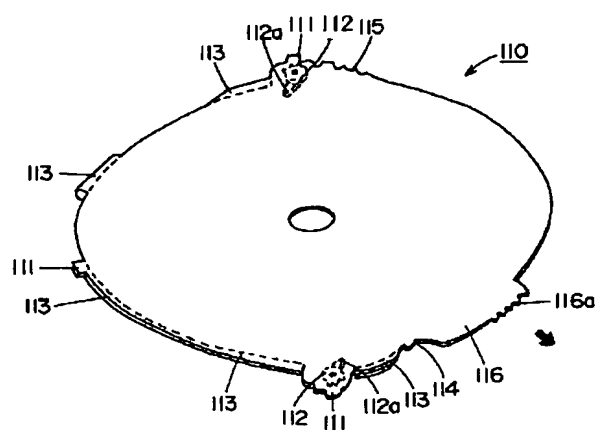
[Drawing 19]



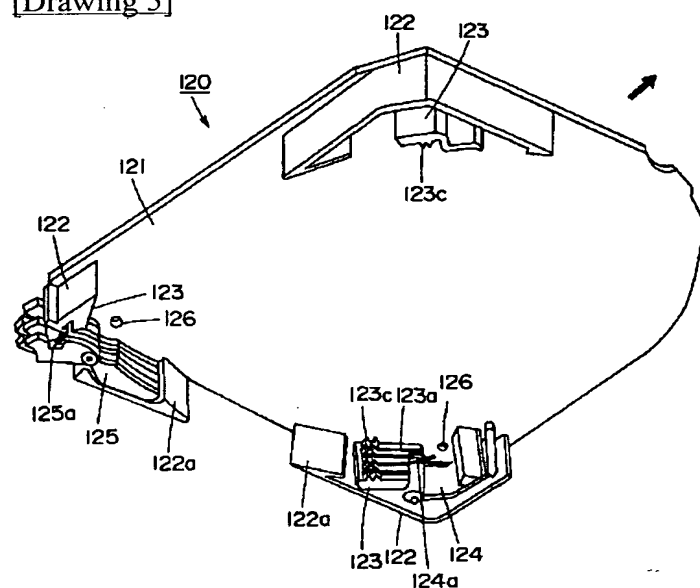
[Drawing 3]



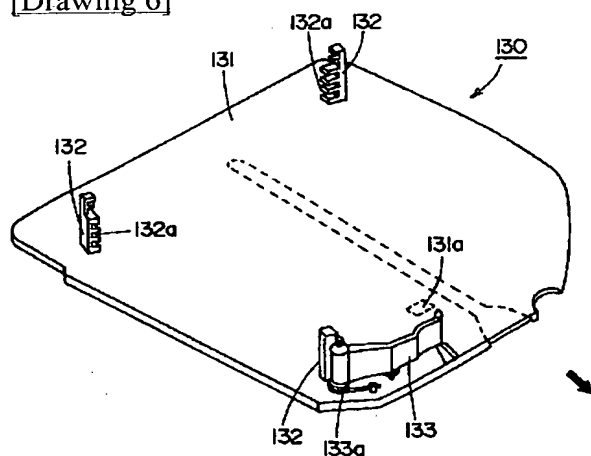
[Drawing 4]



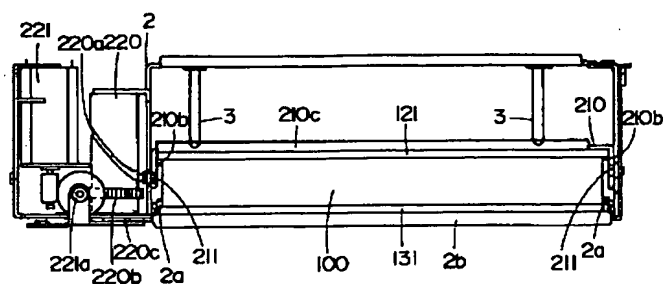
[Drawing 5]



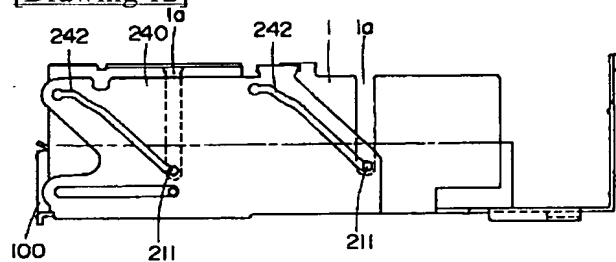
[Drawing 6]



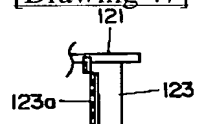
[Drawing 9]



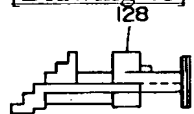
[Drawing 12]



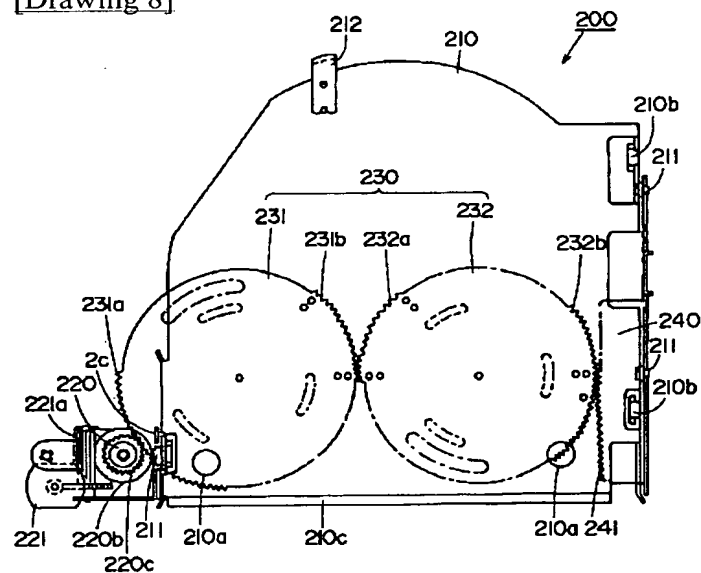
[Drawing 47]



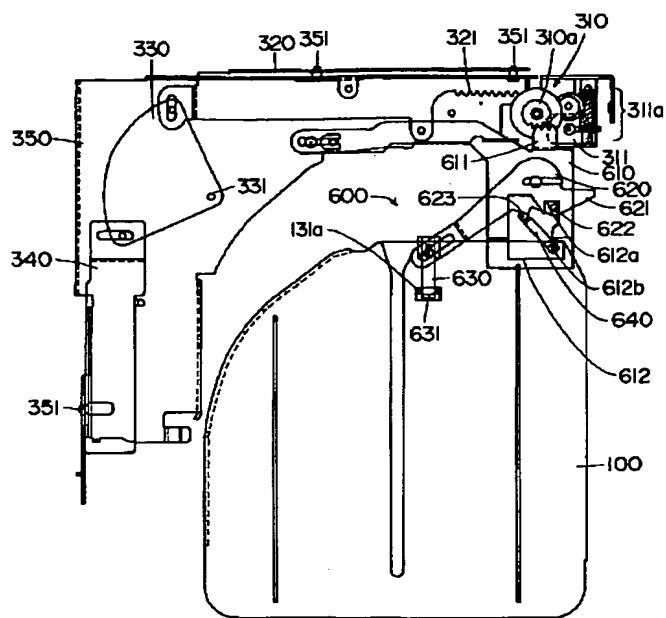
[Drawing 48]



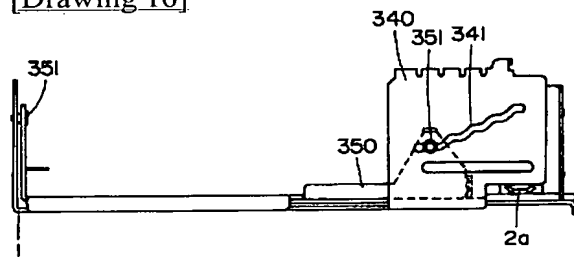
[Drawing 8]



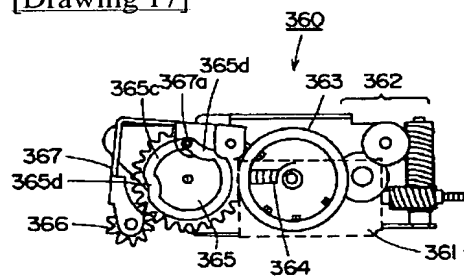
[Drawing 13]



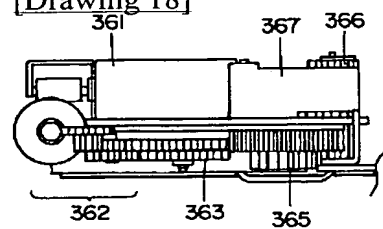
[Drawing 16]



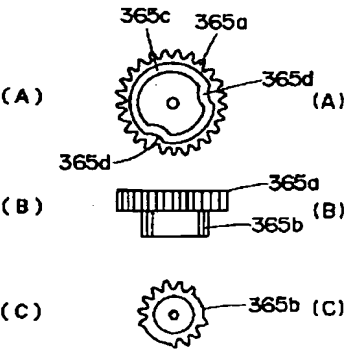
[Drawing 17]



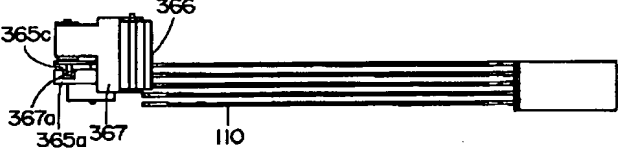
[Drawing 18]



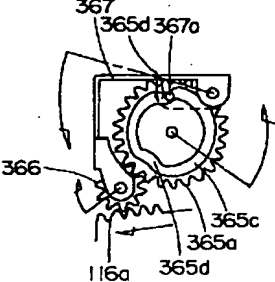
[Drawing 20]



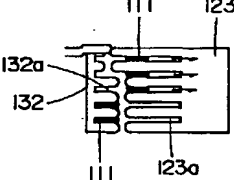
[Drawing 31]



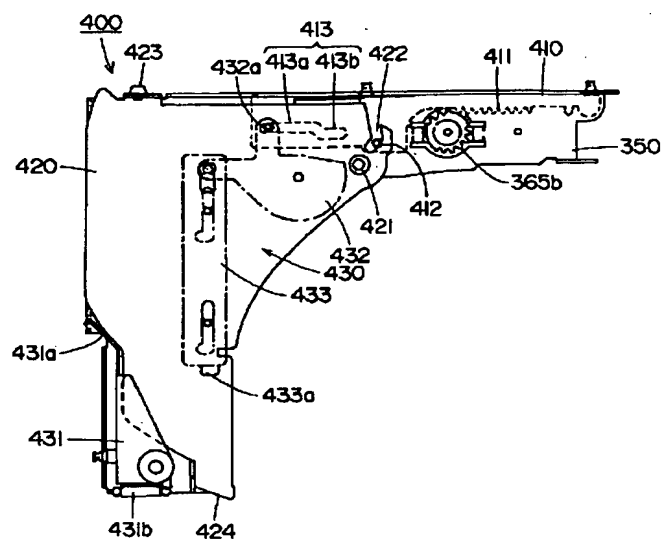
[Drawing 32]



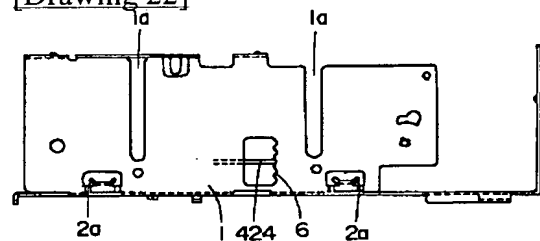
[Drawing 33]



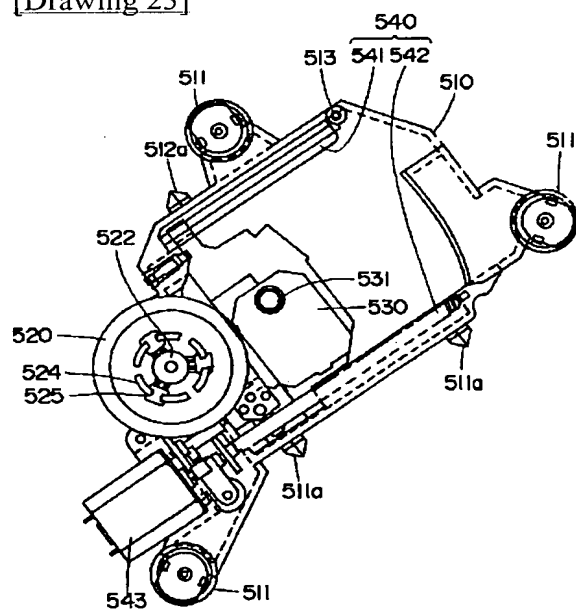
[Drawing 21]



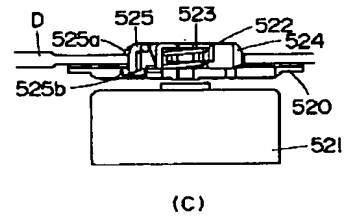
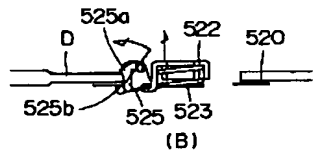
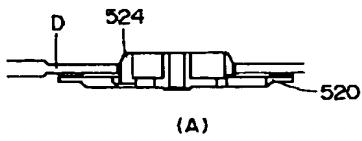
[Drawing 22]



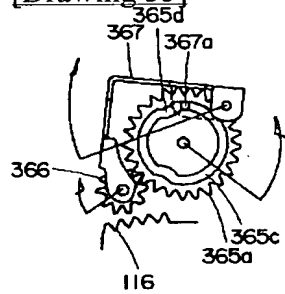
[Drawing 23]



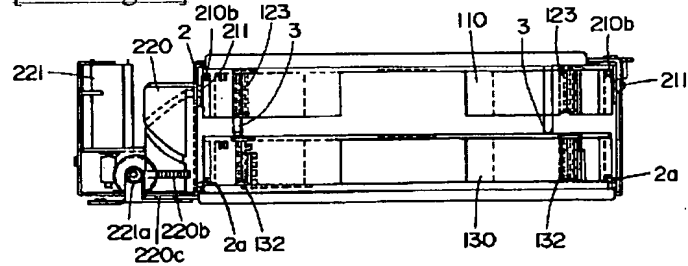
[Drawing 24]



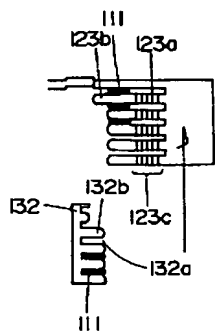
[Drawing 35]



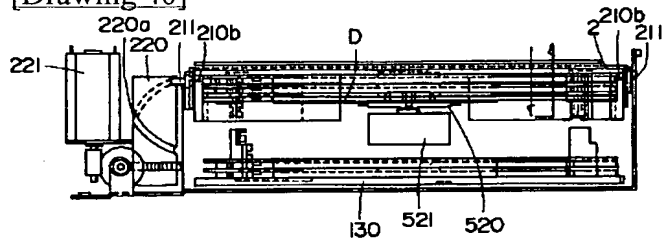
[Drawing 36]



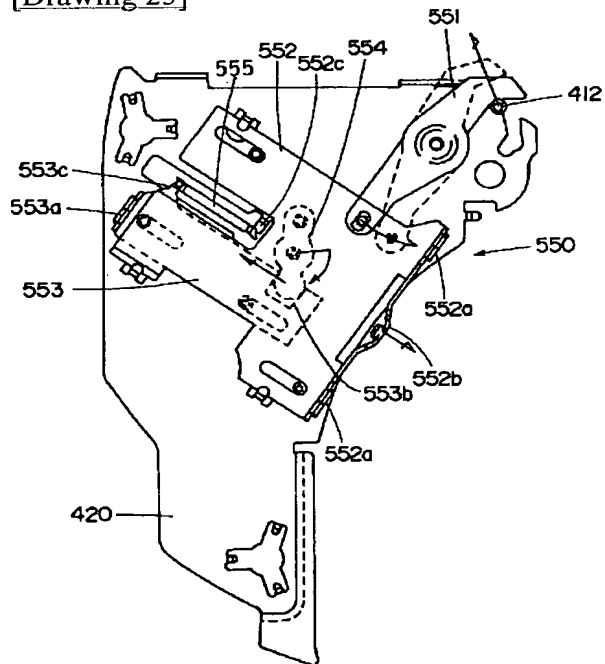
[Drawing 37]



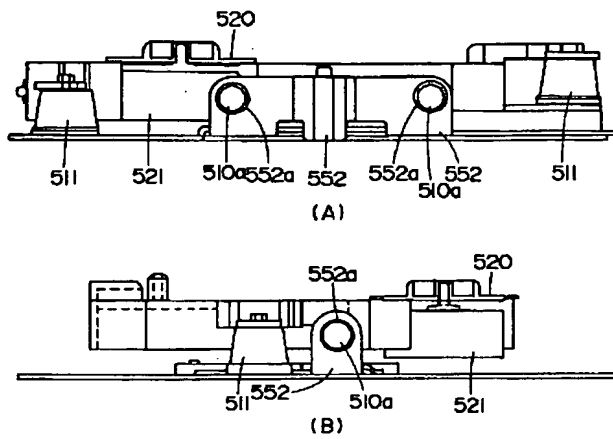
[Drawing 40]



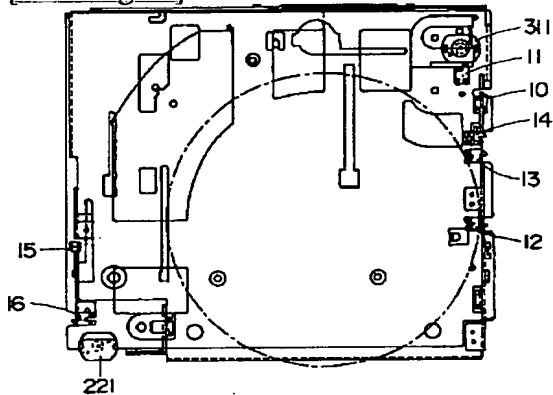
[Drawing 25]



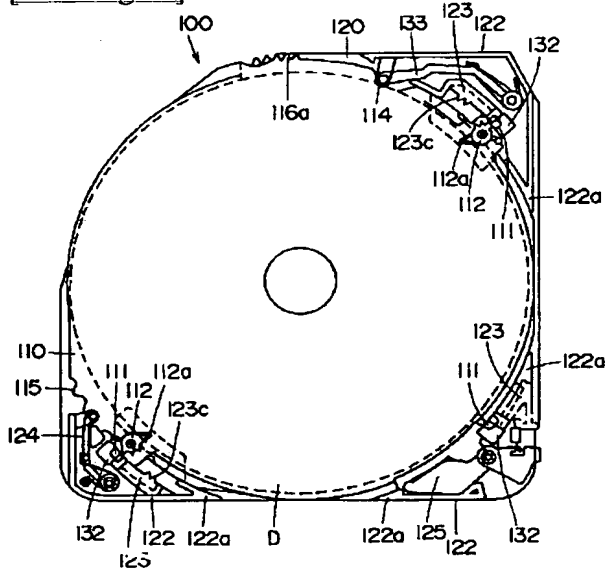
[Drawing 26]



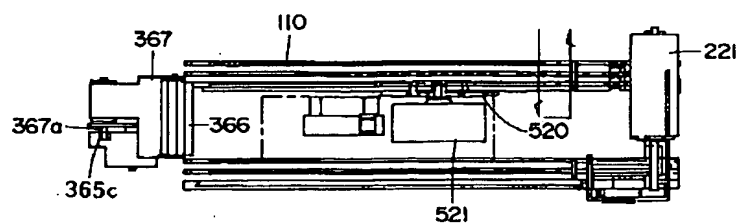
[Drawing 27]



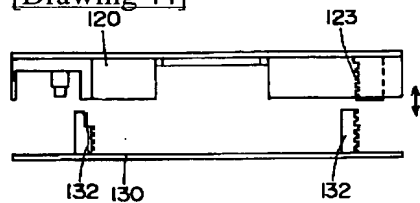
[Drawing 28]



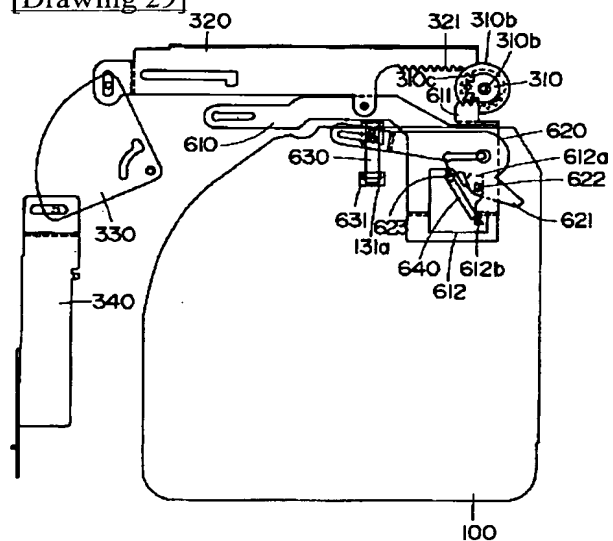
[Drawing 41]



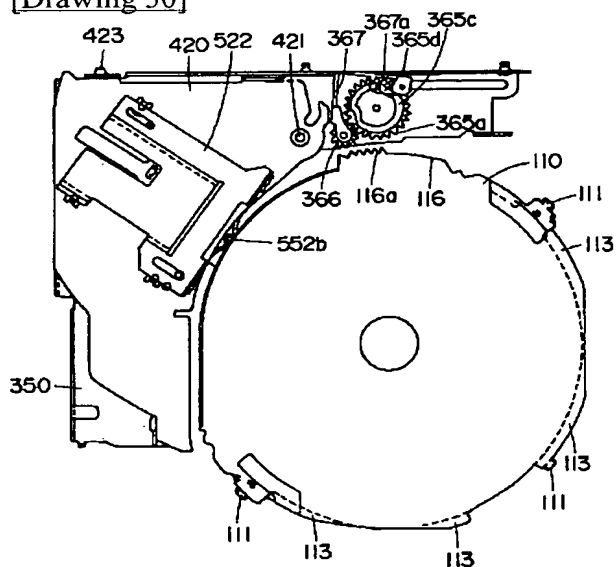
[Drawing 44]



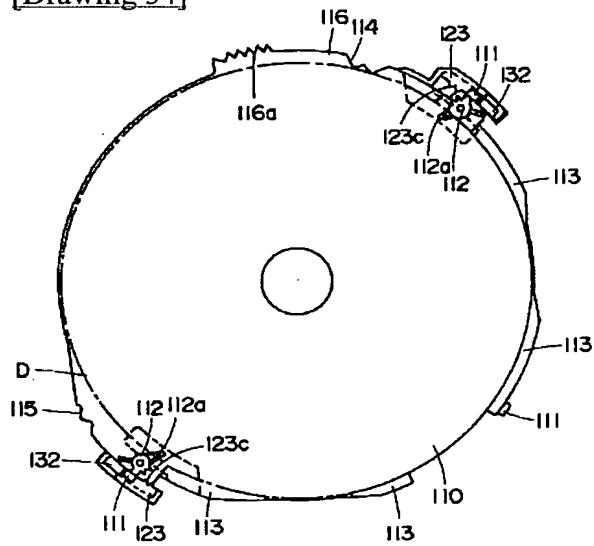
[Drawing 29]



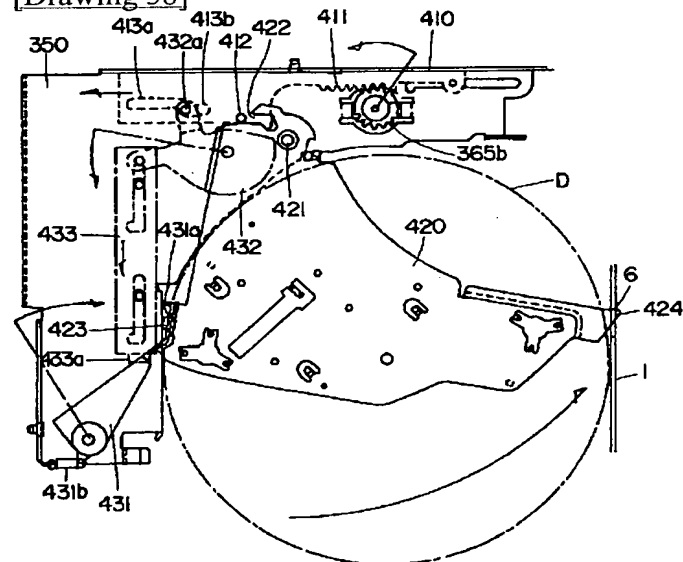
[Drawing 30]



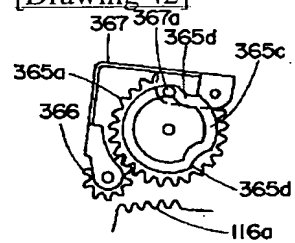
[Drawing 34]



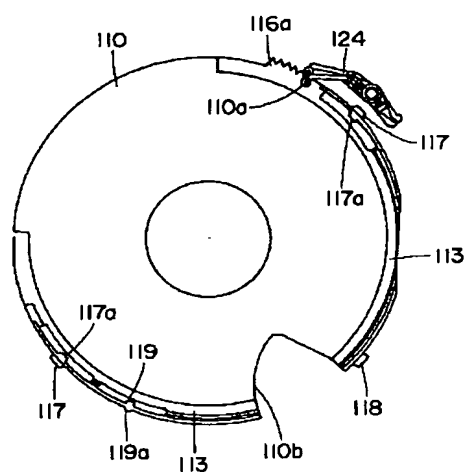
[Drawing 38]



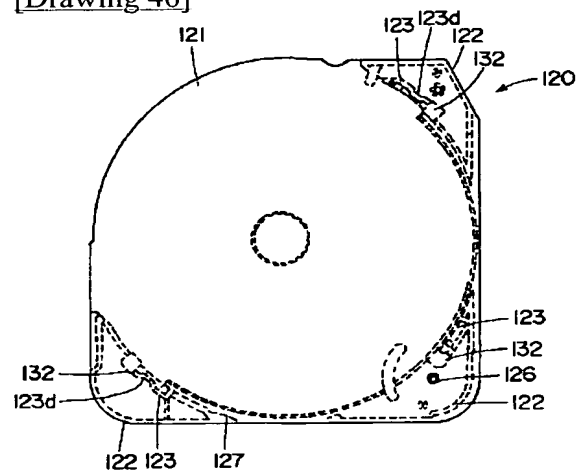
[Drawing 42]



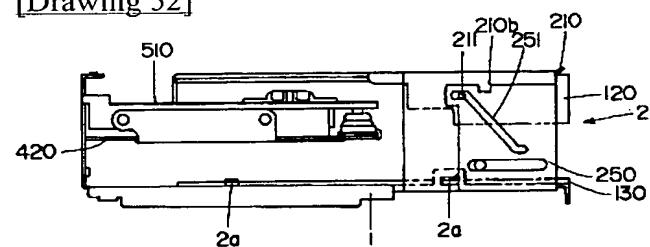
[Drawing 50]



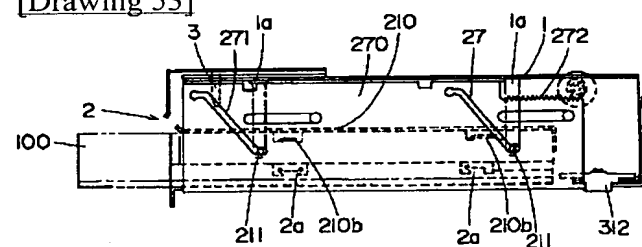
[Drawing 46]



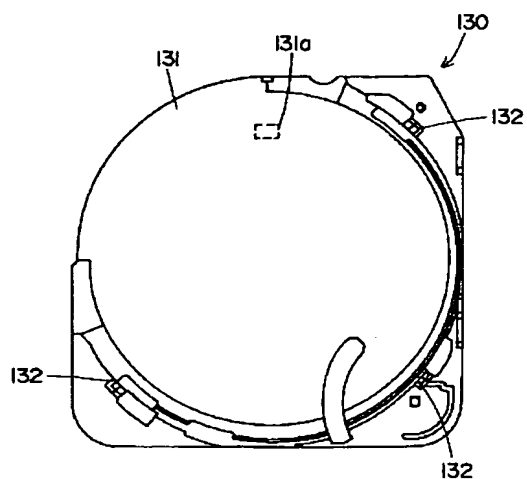
[Drawing 52]



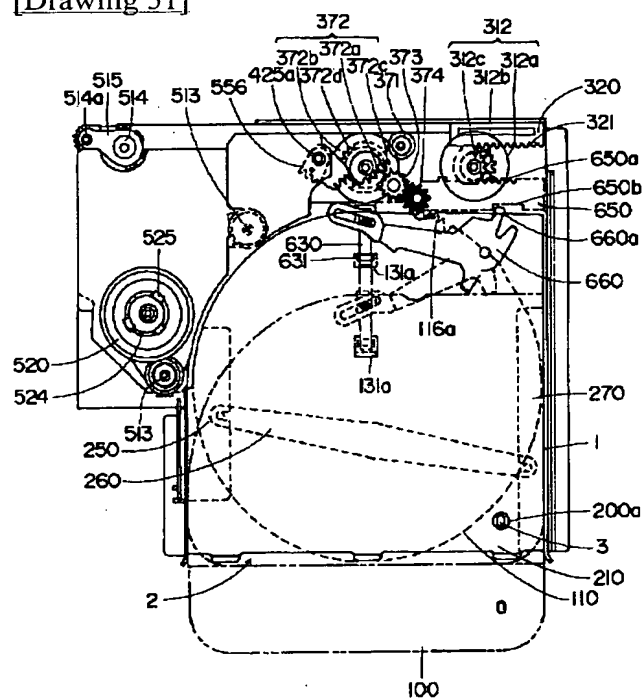
[Drawing 53]



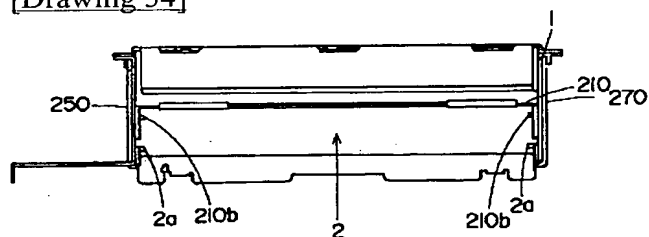
[Drawing 49]



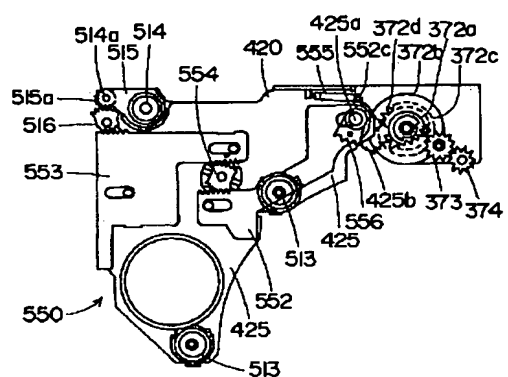
[Drawing 51]



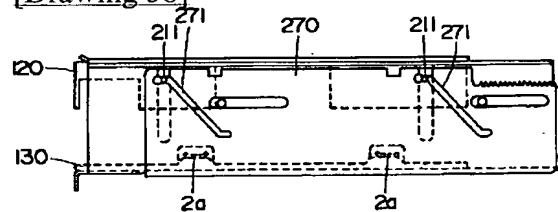
[Drawing 54]



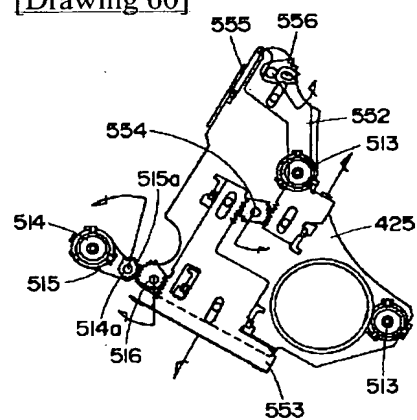
[Drawing 56]



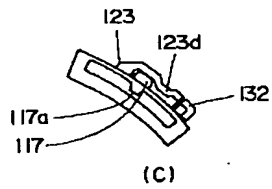
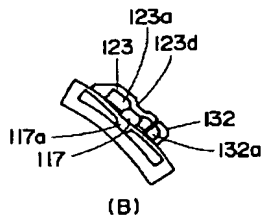
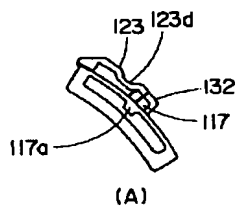
[Drawing 58]



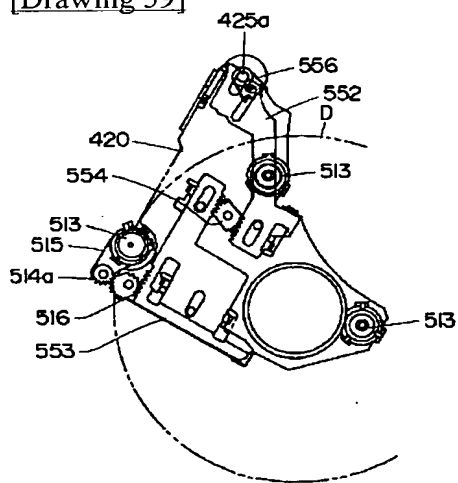
[Drawing 60]



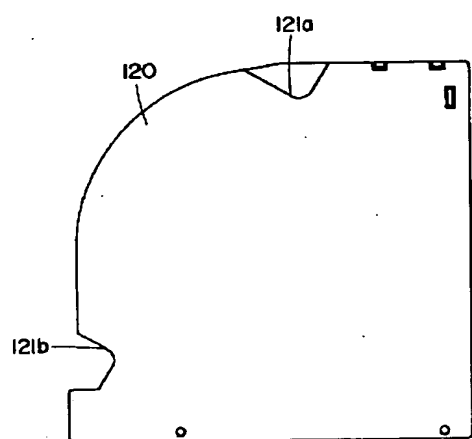
[Drawing 57]



[Drawing 59]



[Drawing 61]



[Translation done.]